

APPENDIX B

Final Small Erosion Repair Program Manual

California Department of Resources Small Erosion Repair Program Manual



Prepared on behalf of:



AECOM

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California Department of Resources Small Erosion Repair Program Manual



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ACRONYMS AND ABBREVIATIONS

APE	area of potential effects
BAC	Baseline Assessment Checklist
BGEPA	Bald and Golden Eagle Protection Act
BO	biological opinion
Board	Central Valley Flood Protection Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
CVFPP	Central Valley Flood Protection Plan
CWA	Clean Water Act
CWC	California Water Code
Delta	Sacramento–San Joaquin River Delta
DFG	California Department of Fish and Game
DPEIR	draft program environmental impact report
DWR	California Department of Water Resources
EA	environmental assessment
EFH	essential fish habitat
EIS	environmental impact statement
ESA	Endangered Species Act
FONSI	finding of no significant impact
FPEIR	final program environmental impact report
FWCA	Fish and Wildlife Coordination Act
GGs	giant garter snake
GIS	geographical information system
HPTP	historic properties treatment plan
Km	kilometer
LMAs	Local Maintaining Agencies
m	meter
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act

MSA	Magnuson–Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLAA	not likely to adversely affect letter
NMFS	National Marine Fisheries Service
NOP	notice of preparation
O&M	operations and maintenance
OHWM	ordinary high-water mark
OPR	Office of Planning and Research
PA	Programmatic Agreement (NHPA section 106)
PEIR	program environmental impact report
PCA	Pesticide Control Adviser
Phase 1	initial 5-year SERP effort
RGP	Regional General Permit
RM	river mile
RWQCB	Central Valley Regional Water Quality Control Board
SAA	streambed alteration agreement
SERP	Small Erosion Repair Program
SHPO	State Historic Preservation Officer
SLC	State Lands Commission
SPCP	Spill Prevention and Control Plan
SRA	shaded riverine aquatic
SRFCP	Sacramento River Flood Control Project
TCPs	traditional cultural properties
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
VMS	vegetation management strategy
VMZ	vegetation management zone
WSE	water surface elevation

A. PROGRAM PROPOSAL

PROGRAM OVERVIEW

INTRODUCTION

The Small Erosion Repair Program (SERP) is a collaborative interagency effort to develop a streamlined regulatory review and authorization process that will facilitate implementation of annual repairs of small erosion sites on levees within the Sacramento River Flood Control Project (SRFCP) area. The SRFCP contains approximately 900 to 1,000 miles of levees. For the initial 5-year (Phase 1) SERP effort, the coverage area is a subset of the SRFCP and represents approximately 300 miles of levees maintained by the California Department of Water Resources (DWR) (see Figure A1).

The term “levees” as used in this document is broadly defined to include levees and associated waterside slopes within the levee prism that are part of the SRFCP and addressed in operations and maintenance (O&M) manuals for identified flood management facilities maintained by DWR or other local maintaining agencies (LMAs).

To maintain the design integrity of the existing flood management system and to maintain or enhance fish and wildlife resources, levees with erosion damage that may lead to further loss of soil or potential failure should be repaired in a timely manner. Currently, small erosion repair projects require issuance of permits on a project-by-project basis. The multiple layers of agency authorizations and level of interagency coordination required for individual site repairs has generally resulted in long-term project delays up to several years, posing a potential public safety hazard and often leaving the eroded areas susceptible to further damage, greater repair costs, and loss of riparian vegetation.

To address this problem, the SERP Subcommittee was formed at the direction of the Interagency Flood Management Collaborative Program Group (Interagency Collaborative Group) on January 17, 2007. The subcommittee consists of a group of federal and state resource agency representatives charged with defining what constitutes a small erosion repair and determining appropriate repair designs that will adequately protect the levee system while avoiding substantial adverse effects on environmental resources. The subcommittee members have worked in concert to craft a program intended to improve current erosion repair practices, and thus to maintain the necessary level of flood risk reduction while seeking to achieve a cumulative net benefit to aquatic and terrestrial fish and wildlife resources, including habitat for sensitive species.

PURPOSE AND OBJECTIVES

The purpose of the SERP is to ensure the continued flood management integrity of the SRFCP levees while protecting environmental resources by providing an efficient method of selecting, evaluating, and permitting small erosion repair projects. The SERP uses programmatic authorizations, issued by federal and state agencies with regulatory

obligations associated with erosion repair projects to streamline the process for implementing small erosion repairs in accordance with conservation-based design and monitoring standards established by the SERP Subcommittee. Projects that qualify under the SERP are eligible to receive authorization within a shortened time frame because they are designed to minimize effects on fish and wildlife resources, including listed species, and to protect and enhance the existing aquatic and riparian habitats comprising the riverine corridor.

The program sets apart similar small erosion repair sites and develops a streamlined permitting process for these sites with the following goals:

- provide quicker repairs to small erosion sites, thereby preventing erosion areas from becoming larger;
- foster consistent regulatory compliance efforts for similar repairs, from the standpoint of both environmental protection and operations and maintenance; and
- obtain measurable data to evaluate program success.

The identified objectives of the proposed levee/bank repairs will be to:

- maintain SRFCP integrity;
- prevent further erosion and loss of riparian and nearshore aquatic habitat;
- minimize the loss of riparian vegetation and endangered species habitat resulting from delayed repairs and construction activities; and
- enhance the existing riparian vegetation corridor at the erosion sites, where applicable.

CONTEXT WITH REGIONAL PRIORITIES

The environmentally sensitive erosion repair practices and the interagency cooperation incorporated into the SERP support a variety of national, regional, and local priorities.

The SERP Subcommittee was established at the direction of the Interagency Collaborative Group to further the overall objectives of that group. The subcommittee was formed to facilitate a collaborative approach to achieving environmental compliance for maintenance of regional flood management facilities. The SERP ensures that required operations and maintenance activities associated with small erosion repairs are conducted in a manner that integrates environmental and flood risk reduction objectives, and thus builds on the regional programs and agency priorities under the purview of the Interagency Collaborative Group.

The 5-year Phase 1 SERP coverage area lies within the larger SRFCP area. Phase 1 projects will be limited to levees maintained by DWR within the SRFCP. After the Phase 1 implementation period, the Interagency Collaborative Group intends to evaluate the

program's success and expand the SERP to include sites repaired by other LMAs throughout the Sacramento–San Joaquin Drainage District.

The SERP is one of many efforts being developed and implemented under the FloodSAFE California Initiative. The FloodSAFE vision is a sustainable integrated flood management and emergency response system throughout California that improves public safety, protects and enhances environmental and cultural resources, and supports economic growth by reducing the probability of destructive floods, promoting beneficial floodplain processes, and lowering the damages caused by flooding. DWR is providing leadership and working with local, regional, state, tribal, and federal officials to improve flood management and emergency response systems throughout California.

The Central Valley Flood Protection Plan (CVFPP), another FloodSAFE effort, is a plan for improving integrated flood management in the Sacramento–San Joaquin Valley. The first edition of this long-term planning document, the 2012 CVFPP, is being prepared in coordination with federal, tribal, regional, and local entities and other interested parties, will be updated every 5 years, and will guide many subsequent implementation activities. The SERP is a part of this plan.

The SERP thus provides a template for potential future expansion and use by LMAs, and is an integral component of regional long-term planning efforts and sustainable integrated flood management goals.

PROGRAM SCALE AND SCOPE

GEOGRAPHIC SCOPE

The SRFCP consists of federally constructed flood management features such as levees, dams, weirs, and bypass channels where associated pumping, drainage, and water management facilities occur within the Sacramento River system. The SRFCP contains approximately 900 to 1,000 miles of levees within approximately 620 miles of waterways (including rivers, creeks, streams, sloughs, and bypasses), waterside banks, and levees of the flood management system (see Figure A1). DWR is responsible for the maintenance of approximately 300 miles of these levees, and approximately 60 other LMAs are responsible for the remainder. For Phase 1, the initial 5 years of the SERP, only levees maintained by DWR (approximately 300 miles) will be included within the SERP. After Phase 1 of the program, the Interagency Collaborative Group intends to evaluate the program's success (see Section H, "Monitoring and Success Criteria") and consider expanding the SERP coverage area to include sites repaired by LMAs throughout the Sacramento–San Joaquin Drainage District.

WATERSHED DESCRIPTION

The SRFCP is located within the Sacramento River watershed, which drains California's northern Central Valley into the middle and lower reaches of the Sacramento River and encompasses 27,000 square miles. On average, over 22 million acre-feet of water flows through the Sacramento River watershed each year (SVWQC 2004:2). The flows

consist of approximately one-third of the total runoff in California and annually average 19,000 cubic feet per second (cfs) (SVWQC 2004:2). The Sacramento River is the longest river (447 miles) entirely within California. The Sacramento River is also the state's largest river by discharge, rising in the Klamath Mountains and flowing south for over 400 miles before reaching Suisun Bay, an arm of San Francisco Bay, and then to the Pacific Ocean.

The Sacramento River's hydrology has been altered by dam, weir, and levee construction. The flood management facilities that DWR maintains are located within the valley floor of the watershed. The valley drainages include the Feather River watershed, American River watershed, Sutter Bypass watershed, Yolo Bypass watershed, and Sacramento River watershed. LMAs, including DWR's maintenance yards, maintain the levees along the waterways listed below, all of which will be eligible for inclusion in the SERP (see Figure A1). However, only the waterways identified below are included in the SERP for Phase 1. After Phase 1 is complete, the Interagency Collaborative Group intends to evaluate the program's success and consider expanding the SERP coverage area to include the repair of erosion sites along the leveed sections of the remaining waterways.

PHASE 1 WATERWAYS

- Butte Creek
- Cache Creek from the Yolo Bypass to the upstream limit of the SRFCP levees
- Cherokee Canal
- Colusa Bypass
- Northern portion of Colusa Main Drain, as identified in Figure A1
- Portions of Feather River, as identified in Figure A1
- Putah Creek
- Sacramento Bypass
- Portions of Sacramento River, as identified in Figure A1
- Sutter Bypass
- Tisdale Bypass
- Wadsworth Canal
- Willow Slough Bypass
- Portions of Yolo Bypass, as identified in Figure A1
- East and West Interceptor Canals

POTENTIAL FUTURE SERP WATERWAYS

- American River from Sacramento River to River Mile (RM) 13
- Bear River from the Feather River to the upstream end of the levees above State Route 65
- Cache Slough
- Southern Portion of Colusa Main Drain, as identified in Figure A1
- Coon Creek Group Interceptor Unit 6
- Deer Creek
- Elder Creek
- Remaining portions of Feather River, as identified in Figure A1
- Georgiana Slough
- Hass Slough
- Honcut Creek
- Lindsey Slough
- Marysville Units 1, 2, and 3
- Miner Slough
- Mud Creek
- Natomas Cross Canal
- Remaining portions of Sacramento River, as identified in Figure A1
- Steamboat Slough
- Sutter Slough
- Knights Landing Ridge Cut
- Three Mile Slough
- Ulati Creek Bypass
- Remaining portions of Yolo Bypass, as identified in Figure A1
- Yuba River from Feather River, upstream to RM 5

AREA TOPOGRAPHY

The northern Central Valley, in which the SRFCP is located, stretches about 150 miles beginning near the town of Red Bluff in the north down to the southeast. There the Central Valley merges with the Sacramento–San Joaquin River Delta (Delta) south of the city of Sacramento. The valley is 30 to 45 miles wide in the southern to central parts, but narrows to about 5 miles near Red Bluff. Its elevation decreases almost imperceptibly from 300 feet at its northern end to near sea level in the Delta (Olmstead and Davis 1961, cited in SVWQC 2004:1). Topography of individual project sites will likely consist of gentle terrain along the creek channels to steep-sloping terrain along creek embankments and levees.

LAND USES

The primary land uses adjacent to the waterways included in the SERP are agricultural, urban, silvicultural, and open space. The largest urban center is the Sacramento

metropolitan area. Agricultural uses include rice, vineyards, pasture, field crops, grain crops, and orchards. Based on acreage, rice is the largest agricultural crop in the Phase 1 SERP coverage area and historically has been the most prominent crop in the Sacramento River watershed. Irrigated pastures and orchards are the next most prominent crops. The number of farms in the area has decreased dramatically in the last decade, primarily caused by loss of farmland to urban and industrial uses (SRWP 2008).

Numerous public lands are located adjacent to the Sacramento River and its tributaries within the Phase 1 SERP coverage area. These include several wildlife refuges such as the Sacramento River Wildlife Refuge, North Central Valley Wildlife Management Area, Sutter National Wildlife Refuge, Stone Lakes National Wildlife Refuge, and Vic Fazio Yolo Wildlife Area. The Sacramento metropolitan area contains more than a dozen parks adjacent to the Sacramento River and American River. Among the larger parks are the American River Parkway and Discovery Park. Brannon Island State Recreation Area is located near the confluence of Three Mile Slough and the Sacramento River.

The major urban centers protected by DWR flood management facilities include Chico, Yuba City/Marysville, the greater Sacramento metropolitan area, and Davis. The confluence of the American River and Sacramento River is located near downtown Sacramento. These urban lands include residential, commercial, and industrial properties.

BIOLOGICAL RESOURCES

Special aquatic and floodplain resources such as riparian habitats and valuable aquatic resources for fish populations are located throughout the Phase 1 SERP coverage area.

The Phase 1 SERP coverage area and immediate vicinity contain potentially suitable habitat for approximately 31 federally listed plants and animal species, identified in the U.S. Fish and Wildlife Service (USFWS) Sacramento Office's species database list,¹ and approximately 18 state-listed species according to the California Natural Diversity Database (CNDDB). Of these species, 12 are dually listed as federally and state-protected species. Overall, approximately 90 special-status species (federally and state listed plus other special status-species) have potential to occur within the Phase 1 SERP coverage area and its immediate vicinity, according to a CNDDB search (CNDDB 2009).

The SERP Subcommittee has determined that eight of the federally listed species will be addressed by the SERP programmatic authorizations. In addition, marine mammal species to be covered will be determined through coordination with the National Marine Fisheries Service (NMFS). State-listed species such as California black rail (state listed as threatened), Swainson's hawk (state listed as threatened), bank swallow (state listed as threatened), greater sandhill crane (state listed as threatened), and western yellow-billed cuckoo (state listed as endangered) will be addressed in the program environmental impact report (PEIR), prepared pursuant to the California Environmental

¹ USFWS. 2009. The database is continually updated and was last updated on January 29, 2009.

Quality Act (CEQA). In Table A1, species indicated with an asterisk (*) have designated critical habitat proposed, finalized, or designated Essential Fish Habitat.

Table A1 Federally and State-Listed Species Addressed through ESA Section 7 or CEQA under the SERP		
Species Common Name	Species Name	Listing Status
California black rail	<i>Laterallus jamaicensis coturniculus</i>	ST
Bank swallow	<i>Riparia riparia</i>	ST
Delta smelt*	<i>Hypomesus transpacificus</i>	ST, FT, SCE
Central Valley Chinook salmon fall-/late fall-run ESU*	<i>Oncorhynchus tshawytscha</i> fall- / late fall-run	EFH Designated
Central Valley steelhead DPS*	<i>Oncorhynchus mykiss</i>	FT
Chinook salmon spring-run ESU*	<i>Oncorhynchus tshawytscha</i> spring-run	ST, FT
Chinook salmon winter-run ESU*	<i>Oncorhynchus tshawytscha</i> winter-run	SE, FE
Giant garter snake	<i>Thamnophis gigas</i>	ST, FT
Greater sandhill crane	<i>Grus Canadensis tabida</i>	ST
North American green sturgeon, Southern DPS	<i>Acipenser medirostris</i>	FT
Swainson's hawk	<i>Buteo swainsoni</i>	ST
Valley elderberry longhorn beetle*	<i>Desmocerus californicus dimorphus</i>	FT
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	SE
Marine mammal species	To be determined	Various
Notes: DPS = Distinct Population Segment EFH = Essential Fish Habitat ESU = Evolutionary Significant Unit FE = Federally listed endangered FT = Federally listed threatened SCE = State candidate endangered SE = State-listed endangered ST = State-listed threatened * Species that have designated critical habitat proposed, finalized, or designated Essential Fish Habitat. Source: Compiled by AECOM in 2011		

HISTORICAL AND CULTURAL RESOURCES

The Phase 1 SERP coverage area includes approximately 300 miles of levees where there may be numerous cultural resources eligible for listing under the National Historic Preservation Act. In general, the resources can be categorized as prehistoric, traditional cultural properties (TCPs), gold mining features, flood management facilities, transportation structures, shipwrecks, historic settlements, and towns.

Native American habitation and mortuary sites are prehistoric resources frequently found along waterways, and thus, could be found within the Phase 1 SERP coverage area. Although many of these sites have been buried as a result of fluvial processes,

agricultural practices, and flood management, significant deposits are still encountered along the waterside and landside of flood management features and in nearby uplands where water channels once occurred.

TCPs are eligible for listing, based on cultural significance derived from the “beliefs, customs, and practices of a living community of people that have been passed down through the generations” (DOI 1998:1). TCPs embrace a wide range of properties, some of which may be located within the Phase 1 SERP coverage area. The identification and evaluation of TCPs can be conducted only by consultation with members of the relevant group of people that ascribe value to the resource, or through other forms of ethnographic research.

The Sacramento Valley contains a vast array of historical activities and associated deposits and structures created by gold mining; therefore, these resources may be found within the Phase 1 SERP coverage area. Some of the most common and abiding remnants of gold mining activity include massive dredge tailings left by historical dredging of river deposits such as the deposits adjacent to the American River near Folsom (Hoover et. al. 1990:290). Other gold mining features may include ditches or water conveyance structures used in hydraulic mining.

Transportation structures encompass a large group of cultural resources and associated historical themes, and many of these structures may be found within the Phase 1 SERP coverage area. These include historic railroads located on levee crowns; bridges that span major waterways; historic road alignments associated with historically significant themes such as reclamation, settlement, and agriculture and ranching (Dames and Moore 1994); and wharfs and docks associated with historically significant themes such as navigation, agriculture, and town settlement.

Shipwrecks associated with Gold Rush era migration and other important themes in California history such as navigation, commerce, and agriculture may occur in major waterways near SERP levees.

Many small towns and settlements occurred and still occur along flood management systems within the Phase 1 SERP coverage area. Some remaining settlements or archaeological traces of settlements are significant for their importance in California history.

Please see Section D, “Regulatory Mechanisms,” for information regarding the Programmatic Agreement (PA) being developed between the U.S. Army Corps of Engineers (USACE) and the State Historic Preservation Officer (SHPO) for the treatment of cultural and archeological resources under the SERP in compliance with the National Historic Preservation Act.

PERMITTING AGENCIES AND REGULATORY AUTHORITIES

Please see Section D, “Regulatory Mechanisms,” for a detailed discussion of the regulatory mechanisms being used to authorize the SERP at the program level.

Table A2 provides a list of the authorizing agencies, their regulatory authorities, and their associated authorizations to be issued for the SERP. The agencies in Table A2 are hereinafter referred to as the “SERP Agencies.”

Table A2 SERP Authorizing Agencies, Authority, and Permits/Agreements		
Agency	Authority	Permit/Agreement
U.S. Army Corps of Engineers	Clean Water Act section 404 and Rivers and Harbors Act section 10	Regional General Permit (RGP)
U.S. Fish and Wildlife Service	Federal Endangered Species Act section 7, Fish and Wildlife Coordination Act, and Migratory Bird Treaty Act	Programmatic Biological Opinion (PBO) and Not Likely to Adversely Affect Concurrence Letter
National Marine Fisheries Service	Federal Endangered Species Act section 7, Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, and Marine Mammal Protection Act	Programmatic Biological Opinion (PBO) and Not Likely to Adversely Affect Concurrence Letter PBO will include conservation recommendations for Essential Fish Habitat
State Historic Preservation Officer	National Historic Preservation Act section 106	Programmatic Agreement
Central Valley Regional Water Quality Control Board	Clean Water Act section 401	CWA section 401 Programmatic Water Quality Certification for RGP
California Department of Fish and Game	California Fish and Game Code section 1600 et seq. California Endangered Species Act	Streambed Alteration Agreement for routine maintenance
Central Valley Flood Protection Board (Board)	California Water Code sections 8361 and 12878. California Code of Regulations Title 23 Division 1.	SERP activities are operations and maintenance activities not requiring Board encroachment permits
Source: Data compiled by AECOM in 2012		

HOW THE SERP PROCESS WORKS

DWR will conduct annual maintenance surveys each spring to identify small erosion sites within the Phase 1 SERP coverage area that will require repairs to maintain the integrity of the flood management system. DWR will conduct a baseline assessment at each of these sites in accordance with Section B, “Baseline Assessment Methodology,” of this manual to evaluate and document the erosion damage. Section B provides detailed discussion of the baseline assessment methodology. Potential SERP projects will be categorized into two tiers based on the size of the project disturbance area, as described in Section B. DWR will identify the appropriate preapproved SERP design template to be applied in accordance with the standards set forth in Section C, “Project Design

Templates and Construction Details,” of this manual. This information will be provided to the relevant SERP agencies as part of the SERP project notification package.

DWR will notify these agencies of the proposed small erosion repair projects according to the process detailed in Section F, “Notification Requirements.” Project notifications for potential SERP projects will be bundled and submitted to the agencies as a package each spring. To maintain consistency, a standard notification form will be used for each project. Section F includes a copy of the notification form and list of other materials to be included in the project notification package. The intent of this process is to create a program-specific notification form and materials package that facilitate timely agency review. Upon receipt of the annual SERP notification packages, the agencies will review the projects and respond to DWR within 30 days with written verification of whether the project(s) is acceptable under the programmatic SERP authorizations, including any additional terms or conditions for approval in their response. Upon receipt of the agencies’ verification of SERP authorization, DWR may proceed with the repairs in accordance with the applicable conservation measures, including standard best management practices. This process thereby will result in a considerably shortened permitting time frame for those projects qualifying for SERP authorization, allowing for timely implementation of the necessary repairs while providing full consideration and protection of environmental resources.

For Phase 1, DWR will conduct monitoring of each SERP repair site for 5 years (or longer as necessary, until the final success criteria are achieved and the agencies have provided written approval) and submit annual monitoring reports to the agencies to track and evaluate the success of the program. Section H, “Monitoring and Success Criteria,” presents the monitoring requirements and success criteria for SERP projects. Section J, “Annual Monitoring Reports,” details the format and required contents for the annual monitoring reports.

SERP project information, including project notification packages, annual monitoring reports, and agency correspondence, will be stored electronically by DWR and used to develop a geographical information system (GIS) database to track SERP projects. The database will be made available to the SERP agencies. This will help ensure that project impacts and enhancement of habitat and other aquatic resource functions in the Phase 1 SERP coverage area are well documented and adequately monitored to achieve the program goal of net beneficial effects.

The following flowchart (Figure A2) outlines the SERP project implementation process.

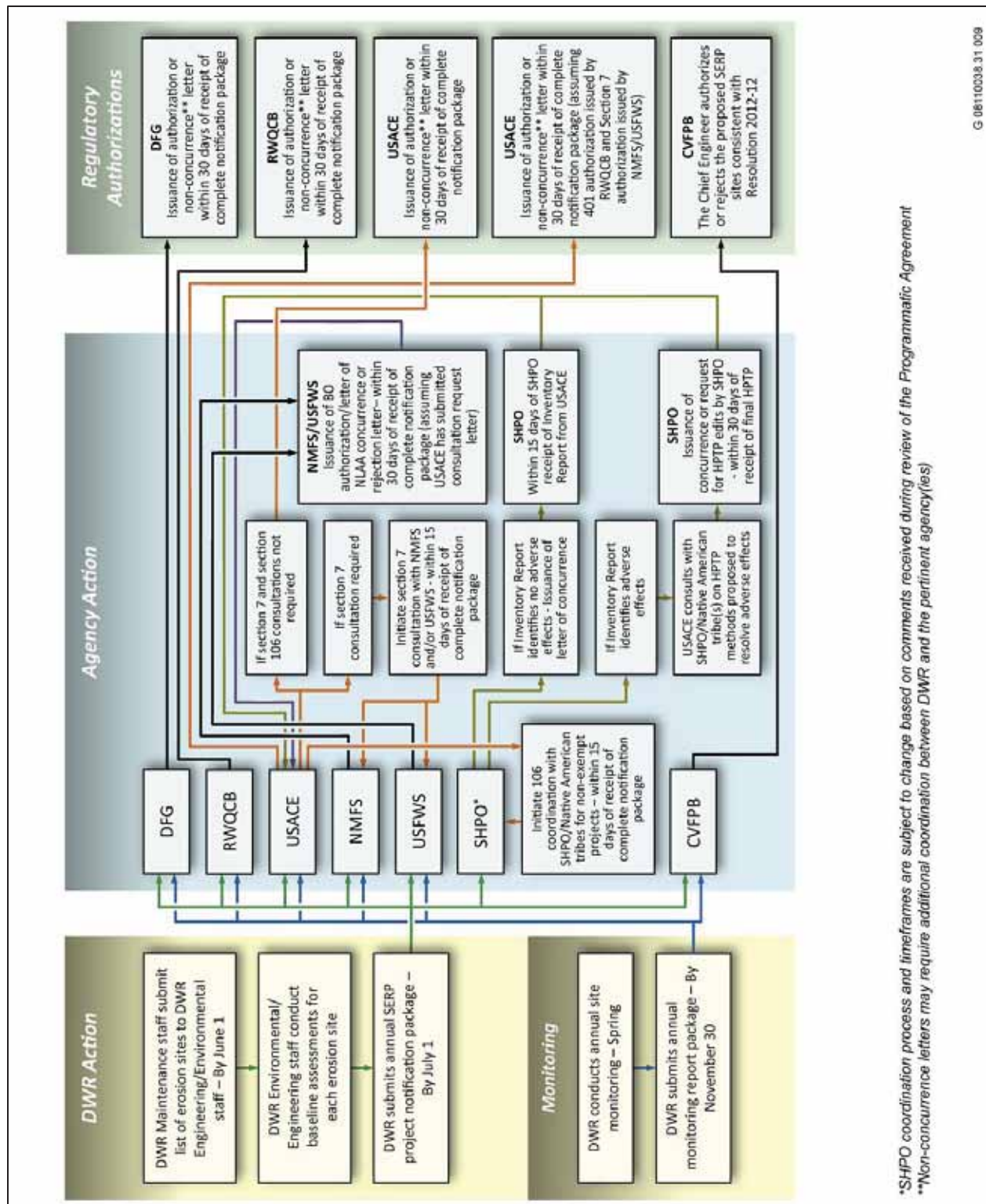


Figure A2

SERP Implementation Process Flowchart

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B. BASELINE ASSESSMENT METHODOLOGY

This section describes the process DWR will use to evaluate damage at erosion sites that may qualify for repair under the SERP. The section includes a checklist that DWR staff will use to document baseline conditions such as site location, site dimensions, adjacent vegetation conditions, site access, and presence of existing revetment or other flood management facilities. Additionally, this section briefly describes the proposed SERP database, which will use GIS technology and be available to the SERP agencies. The SERP database will be a central source for information on already-completed SERP projects to facilitate cumulative impacts analysis and identify nearby SERP projects.

PROCESS FOR DEVELOPING AND USING PROJECT-SPECIFIC BASELINE ASSESSMENT

The baseline assessment provides a mechanism for evaluating and documenting the nature and extent of damages and existing environmental conditions at potential SERP project sites. Conducting the baseline assessment will be the first step in the process of selecting a site for repair under the SERP, determining the appropriate repair technique, and developing a project site plan based on the selected SERP design template.

As the initial step of the baseline assessment, DWR Maintenance Environmental Support Branch staff will conduct a field evaluation at each potential SERP project site annually in spring. For each site, DWR staff will complete a Baseline Assessment Checklist (BAC) (included in the SERP Project Pre-Construction Notification Form in Section F, "Notification Requirements") and photograph the damaged and adjacent areas to document the site conditions and support DWR's determination of the appropriate repair technique. In completing the BAC, DWR will identify the appropriate SERP design template and provide the rationale for the determination.

DWR will provide the completed BAC to the agencies as part of the project notification package, as outlined in Section F, "Notification Requirements." Agency staff members will use this information to determine whether the project meets the criteria for coverage under their agency's programmatic SERP authorization.

DEFINING AND CLASSIFYING SERP PROJECTS

The focus of the SERP is to facilitate streamlined authorization and implementation of small erosion repair projects and thereby prevent larger erosion sites that further jeopardize the integrity of the flood management system and may cause greater impacts to aquatic resources and associated riparian and upland habitats. The erosion repair designs were developed to be self-mitigating through incorporation of bioengineering erosion control methods. The subcommittee has defined project size and placement limits that minimize individual and cumulative effects and yet allow for practical utility by DWR in situations where several small sites occur in close proximity and can become larger sites if left untreated. The SERP Subcommittee established the

following sizing and spacing criteria for defining and classifying potential SERP projects; projects not meeting these criteria will not be eligible for inclusion in the SERP.

A two-tiered definition for SERP sites has been developed for the program by the SERP Subcommittee. This approach establishes sizing and spacing limitations while providing flexibility for situations that warrant repair of sites that are larger or closer to one another. Additionally, classifying projects as Tier 1 or Tier 2 is intended to facilitate agency evaluation and approval of the proposed erosion repair projects contained in DWR's annual SERP project notification packages.

The Tier 1 site definition is as follows:

A site can be considered for Tier 1 if the footprint of new bank protection materials, including any additional vegetated area that will be disturbed by equipment during construction, is 0.1 acre or less with a maximum linear foot limit of 264 feet. A separation of 500 feet between sites repaired in the same year is required.²

The Tier 2 site definition is as follows:

A site can be considered for Tier 2 if the footprint of new bank protection materials, including any additional vegetated area that will be disturbed by equipment during construction, is 0.5 acre or less with a maximum linear foot limit of 1,000 feet.

A maximum of 15 SERP projects are anticipated to be implemented annually during Phase 1 of the SERP. To ensure that SERP projects are unconnected, single and complete actions and not part of a larger action that will exceed the SERP's size and placement limits, each project must demonstrate independent utility. A SERP project will be considered to have independent utility if it will be constructed absent the construction of other projects in the project area.

GIS DATABASE

DWR will electronically store SERP project information, including project notification packages, annual monitoring reports, and agency correspondence, over the entire period of the program (i.e., at least the 5-year Phase 1 period, or longer if the program is extended). This information will be used to develop a GIS database to track SERP projects. Although the parameters of the database have not been established, the database will be structured to allow for development of information layers that will facilitate project and program monitoring. Importantly, the GIS database will identify SERP project locations and dimensions and provide historical information that will

² Assuming the 0.1 acre is a square (2D figure with four straight sides, four interior angles and whose four sides are equal length), the conversion of 0.1 acre to linear feet would be the following: 1 acre = 43,560 square feet; 0.1 acre = 4,356 square feet. By taking the square root of 4,356 square feet, the length of each side is 66 feet. Thus the perimeter would be 264 feet. Note: If 0.1 acre is a circle, the circumference of the circle would be 117 linear feet. So, as a compromise to meet the SERP's goals, NMFS will agree to the maximum of 264 linear feet (Martinez, pers. comm., 2010).

facilitate cumulative impact analyses throughout the life of the program. The database will be available to the SERP agencies. This will help ensure that both project impacts and enhancement of habitat and other aquatic resource functions in the Phase 1 SERP coverage area are well documented and adequately monitored to achieve the program goal of self-mitigation.

HYDRAULIC ANALYSIS

A hydraulic analysis was conducted to evaluate the potential impact of vegetation (shrub species of willow) on water surface elevation (WSE) for a prior repair site that was deemed representative of future SERP project sites with the greatest potential hydraulic impact. This repair site was selected based on its location along Butte Creek, a very narrow, leveed channel. The analysis also addressed the sensitivity of channel floodplain width on WSE. The hydraulic analysis was conducted to address the Central Valley Flood Protection Board (Board) staff's concerns over SERP's possible hydraulic impacts. The various scenarios evaluated were developed in coordination with Board staff and included incremental reviews by the Board staff that provided additional comments. The April 27, 2012 Staff Report—Resolution 2012–20, summarizes the hydraulic modeling conclusions as follows:

1. The hydraulic modeling results for the assumed base condition (“n” =0.045) and the mature vegetation condition (“n” =0.06) at the representative 390 foot wide repair site show that the change in the WSE is less than 0.1 foot.
2. For higher “n” values (0.07 and 0.08), the channel should be wider than the representative site to ensure that the maximum anticipated increase in WSE does not exceed 0.1 foot. The modeling results showed that the maximum change in WSE was less than or equal to 0.1 foot for “n”=0.07 at a channel width of 700 feet. Similarly, the maximum change in WSE was less than or equal to 0.1 foot for “n”=0.08 at a channel width of 1,400 feet.
3. The modeling addressed Board staff's concerns of potential adverse hydraulic impacts for SERP projects. Depending on “n” value and wide channels, most proposed SERP projects for wide channels and bypasses are anticipated to produce negligible hydraulic impacts. For narrower channels, additional site-specific hydraulic analyses may be required to assess potential impacts to WSE.
4. The following table provides guidance based on hydraulic modeling of the Butte Creek “representative site for DWR to initially assess the likelihood of adverse hydraulic impacts of proposed SERP sites. For proposed sites at channel or bypass widths less than the following thresholds, an initial hydraulic analysis should be conducted and submitted by DWR to the Board as part of the annual SERP repair proposal.

Table B-1 Channel Width Thresholds for Minimal Hydraulic Impacts		
Manning's "n"	Site Description	Minimum Channel Width (feet) to Maintain Anticipated WSEL increase at or below 0.1 foot
0.06	Butte Creek "representative"	390
0.07	Modeled	700
0.08	Modeled	1,400
Source: Hydraulic Analysis of a bioengineered repair, representative of repairs under the Small Erosion Repair Program (SERP), Mathiyarasan, April 18, 2012		

C. PROJECT DESIGN TEMPLATES AND CONSTRUCTION DETAILS

This section presents the SERP project design templates and outlines the parameters for applying each template. Construction and planting details specific to each template are included in the template drawings. General construction and planting requirements, along with sequencing and equipment staging information, are described below. Additional program requirements for project construction activities such as equipment access and fueling, construction timing, material stockpiling, and erosion control are outlined in Section I, “Conservation Measures.”

DEVELOPMENT OF THE SERP DESIGN TEMPLATES

Bank protection design depends on site-specific conditions. Some of the considerations include (1) the type of bank failure such as sloughing, or wave wash; (2) hydraulic conditions in the area such as shear stress and slope angle; and (3) channel characteristics adjacent to the erosion site.

To capture some of these variables, the SERP Subcommittee evaluated a range of erosion repair alternatives that would provide the necessary level of flood risk reduction. The group focused on design alternatives that incorporate bioengineering practices and thereby provide for self-mitigation opportunities for levee maintenance projects. The designs that were evaluated have been successfully applied along California waterways by various public flood protection and transportation agencies. The SERP group considered those designs that would provide the necessary level of flood risk reduction while benefitting fish and wildlife resources, including habitat for native species.

Twelve designs that were potentially applicable to the SERP were evaluated. These design alternatives met the primary program objectives of providing both the necessary level of flood risk reduction and the opportunity for self-mitigation as defined in Section G, “Mitigation.” In addition to these primary SERP objectives, the group also considered the following evaluation factors:

- types of levee damage that generally occur in the Phase 1 SERP coverage area,
- long-term maintenance requirements,
- wildlife hazards,
- aesthetics,
- difficulty of installation,
- adequacy of the design in terms of potential vegetation coverage area, and
- levee vegetation management strategy (VMS) set forth in DWR’s 2012 CVFPP and associated Conservation Framework.

SERP DESIGN TEMPLATES

Based on the above criteria, seven design templates were selected: bank fill rock slope with live pole planting, willow wattle with rock toe, branch layering, rock toe with live pole planting, soil and rock fill at the base of a fallen tree (with rootwad revetment option), bank fill rock slope with native grass planting, and bank fill rock slope with emergent vegetation planting. The templates, which DWR will use as a guide to design repairs at individual SERP sites, are presented as Templates 1–7 at the end of this subsection.

The design templates included in this manual are not to scale and are only intended for use as a guide in developing the project-specific cross-section and site plan diagrams. The project-specific diagrams will be submitted with the project notification materials, as outlined in Section F, “Notification Requirements.”

Each design template includes:

- a typical cross-section of the design, plan view with details as needed, and general construction specifications; and
- an information box that describes the template’s applicability and limitations (e.g., slope, flow velocity), planting zone descriptions, reference to the SERP rock-sizing chart and plant list (included below), and general construction notes and planting specifications such as rock placement locations relative to water levels, recommended distance between plantings and water table, recommended length of cuttings, etc.

The SERP design templates are generalized program-level diagrams that describe and outline the particular bank stabilization techniques that the SERP Subcommittee has determined are applicable to SERP erosion sites. The appropriate design template for individual SERP repair sites will be selected by DWR using the applicability matrix below as a guide. DWR will provide its rationale for selecting an identified template in the BAC included in Section B, “Baseline Assessment Methodology.” The BAC will be provided to the SERP agencies with the annual project notification materials as described in Section F, “Notification Requirements.”

DWR will use the technique descriptions provided on the templates to develop the individual plan view and cross-section diagrams unique to each specific project site. For each SERP project site, DWR will incorporate the planting, soil and rock placement, and other technique-specific information from the program design templates into the project-specific cross-section and plan-view diagrams. This will help ensure that DWR correctly applies the agreed-on bank stabilization techniques. The intention of the program design templates is to provide framework descriptions of applicable bank stabilization methodologies that can be applied to SERP project sites to increase the potential to achieve a successful outcome.

- The project design figures (cross-section and plan view diagrams) created for each individual SERP project site will describe the planting specifications and detailed installation methodologies best suited for site-specific repairs. Development of site-specific design details will be a coordinated effort by DWR engineering, environmental, and maintenance staff.
- The SERP Template Applicability Matrix (Table C1) will be used by the DWR project engineers as a guide in selecting the appropriate design template to be applied at proposed SERP repair sites.

SERP ROCK-SIZING CHART

The suggested minimum riprap gradations for stream bank protection in Table C2 and the rock-sizing chart in Table C3 are excerpted from the stream bank protection guidelines of the New Brunswick (Canada) Department of Agriculture and Aquaculture (2009). Both tables provide information to help DWR determine the appropriate rock size for repairing erosion damage under the SERP. Larger rock size will be required in areas subject to wave action and areas with steep slopes. For example, a class I gradation may be used for erosion sites where a local water velocity up to 10 feet per second exists. For class I, Table C2 describes the distribution (gradation) of rock sizes and related weights that when combined will average 12-inch or 80-pound rock. This average diameter for rock is referred to as D_{50} . Table C3 provides the D_{50} and related weights for a greater variation of local water velocities.

WILLOW POLE PLANTING CRITERIA

Willow pole plantings are a major revegetation component of several of the SERP design templates. As such, specific willow pole planting criteria are presented below to guide revegetation efforts.

The willow pole cuttings should be 1 to 3 inches in diameter. The length of willow pole cuttings will be largely determined by the depth to the summer/fall water line and erosive force of the stream at the planting site. The length will typically range between 36 and 72 inches. Approximately four-fifths of the length of the poles should be below the ground surface, with the bottom ends reaching the water table or capillary fringe. The bottom ends of the poles should be cut at a 45-degree angle at the time of harvest to allow quick recognition of the bottom end of the cuttings. Plantings will be set in the holes with the buds facing upward.

INCORPORATION OF CVFPP LEVEE VEGETATION MANAGEMENT STRATEGY

The SERP is part of the 2012 CVFPP, which also includes an associated Conservation Framework. The following text and diagrams associated with the CVFPP levee VMS are excerpted from the 2012 CVFPP and associated Conservation Framework, and will be incorporated into the SERP.

Table C1
SERP Template Applicability Matrix

Templates	Description	Bank Slope (max)	Wildlife Applications*	Erosion Type**	Stream Type***	Setback or Bypass Levee****
Template 1: Bank fill Rock Slope with Live Pole Planting	Combination of covering a slope with rock and live pole cuttings	1:1	Riparian habitat + Anadromous fish + Giant garter snake -	1,2,3,4	A,B,C	Limited
Template 2: Willow Wattle with Rock Toe	Placement of bundles of branches in trenches to slow over-bank erosion	2:1	Riparian habitat+ Anadromous fish+ Giant garter snake -	2,3,5	B,C	Not likely
Template 3: Branch Layering	Layering of live branch cuttings with layer of compact fill	1.5:1	Riparian habitat+ Anadromous fish + Giant garter snake -	1,3,4,5	A,B,C	Limited
Template 4: Rock Toe with Live Pole Planting	Placement of some of the live stakes in compacted soil (typically smaller scale erosion sites)	1:1	Riparian habitat + Anadromous fish + Giant garter snake -	1,2,3	A,B,C	Not Likely
Template 5: Soil and Rock Fill at the Base of a Fallen Tree	Fill in areas where trees have fallen	1.5:1	Riparian habitat + Anadromous fish +	3	A,B,C	Limited
Template 6: Bank Fill Rock Slope with Native Grass Planting	Planting grass only with riprap and no woody installation	1:1	Giant garter snake +	1,2,3,4	A,B,C	Likely
Template 7: Bank Fill Rock Slope with Emergent Vegetation Planting	Similar to template 1, but retaining or flattened area near toe for emergent vegetation	1:1	Giant garter snake + Delta smelt+	1,2,3,4	B,C	Limited

*** Wildlife Applications Key**

Riparian habitat+ improves site for wildlife dependent on riparian vegetation

Anadromous fish + improves site for anadromous fish because of increased shaded riverine cover and large woody debris

Giant garter snake – not recommended in areas where giant garter snake occur because of increased cover of riparian vegetation

Giant garter snake + improves giant garter snake habitat by increasing cover and opportunities for basking and foraging

Delta smelt + improves Delta smelt habitat by increasing emergent vegetative cover

**** Erosion type:**

1 = Erosion caused by fast flowing streams; 2 = Extensive toe level erosion; 3 = Slumps created in stream bank;

4 = Damage caused by occasional heavy flows; 5 = Over-land runoff erosion:

***** Stream type:**

A = main stem; B = tributary; C = Canal/Slough

******Setback or Bypass:**

Likely = best chance of success; Limited = dependent on existing vegetation and access to water;

Not likely: low potential for success

Source: Ohio Iowa Department of Natural Resources 2006

Table C2 Suggested Minimum Riprap Gradations for Stream Bank Protection		
Class I		
Nominal 12-inch-diameter or 80 pounds (lb). Allowable local velocity up to 10 feet per second grading specification:		
	100% smaller than 18 inches or	300 lb
at least	20% larger than 14 inches or	150 lb
at least	50% larger than 12 inches or	80 lb
at least	80% larger than 8 inches or	25 lb
Class II		
Nominal 20-inch-diameter or 400 lb. Allowable local velocity up to 13 feet per second grading specification:		
	100% smaller than 30 inches or	1,500 lb
at least	20% larger than 24 inches or	700 lb
at least	50% larger than 20 inches or	400 lb
at least	80 % larger than 12 inches or	70 lb
Class III		
Nominal 30-inch-diameter or 1,500 lb. Allowable local velocity up to 15 feet per second grading specification:		
	100% smaller than 48 inches or	5,000 lb
at least	20% larger than 36 inches or	2,500 lb
at least	50% larger than 30 inches or	1,500 lb
at least	80% larger than 20 inches or	400 lb
Note: The percentages quoted are by weight; the sizes quoted are equivalent spherical diameters (1.24 volume). Source: New Brunswick (Canada) Department of Agriculture and Aquaculture 2009		

Table C3 Riprap Minimum D₅₀ Sizing Chart		
Water Velocity (feet per second)	Rock D₅₀ (inches)	Rock Weight (pounds)
5	4	3
6	6	10
7	8	24
8	10	47
9	12	81
10	15	158

Table C3 Riprap Minimum D50 Sizing Chart		
Water Velocity (feet per second)	Rock D₅₀ (inches)	Rock Weight (pounds)
11	18	273
12	20	375
13	24	650
14	27	925
15	30	1,268
16	35	2,013
Source: New Brunswick (Canada) Department of Agriculture and Aquaculture 2009		

SERP PLANT LIST

DWR will use the plant list in Tables C4, C5 and C6 to develop project-specific plant lists and seed mixes. SERP project sites will generally not be irrigated. Appropriate planting techniques and timing will be required to ensure the successful establishment of planted vegetation. All SERP project planting will be conducted in compliance with the interim vegetation inspection criteria presented in Figures C1 and C2. The project-specific plant lists will be provided to the agencies with the project notification materials as outlined in Section F, "Notification Requirements."

Table C4 Native Perennial Grass Seed Mix and Pure Live Seed Application Rate (Zones 1 and 2) for the Small Erosion Repair Program			
Species	Pounds/Acre	Pure Live Seeds/Square Foot	% Mix
Purple needlegrass (<i>Nassella pulchra</i>)	16	21.9	53%
Creeping wildrye (<i>Leymus triticoides</i>)	4	10.1	13%
Slender wheatgrass (<i>Elymus trachycaulus</i>)	4	7.3	13%
Blue wildrye (<i>Elymus glaucus</i>)	3	6.7	10%
Meadow barley (<i>Hordeum brachyantherum</i>)	3	6.7	10%
Total for Mix	30	52.7	100%
Source: Data compiled by EDAW in 2009			

Table C5 Small Woody and Herbaceous Vegetation (Zone 2) Planting Palette for the Small Erosion Repair Program		
Species	Spacing	Container Type
Narrowleaf willow (<i>Salix exigua</i>)	2 feet O.C.	live cutting
Arroyo willow (<i>Salix lasiolepis</i>)	2 feet O.C.	live cutting
Pacific willow (<i>Salix lucida</i> ssp. <i>lasiandra</i>)	2 feet O.C.	live cutting
Red willow (<i>Salix laevigata</i>)	2 feet O.C.	live cutting
California blackberry (<i>Rubus ursinus</i>)	6 feet O.C.	treepot 4
California wild rose (<i>Rosa californica</i>)	6 feet O.C.	treepot 4
Mulefat (<i>Baccharis salicifolia</i>)	4 feet O.C.	treepot 4
Buttonbush (<i>Cephalanthus occidentalis</i>)	4 feet O.C.	treepot 4
Santa Barbara sedge (<i>Carex barbarae</i>)	2 feet O.C.	plug
Deergrass (<i>Muhlenbergia rigens</i>)	2 feet O.C.	plug
Note: O.C. = on center Source: Data compiled by EDAW in 2009		

Table C6 Lower Slope Vegetation (Zone 3) Planting Palette for the Small Erosion Repair Program		
Species	Spacing	Container Type
Baltic rush (<i>Juncus balticus</i>)	2 feet O.C.	plug
Common tule (<i>Schoenoplectus acutus</i>)	2 feet O.C.	plug
Note: O.C. = on center Source: Data compiled by EDAW in 2009		

Levee vegetation management practices and procedures are an important component of the Flood System Operations and Maintenance Program, and of numerous ongoing and proposed flood risk reduction projects. Through management actions set forth in the CVFPP and associated Conservation Framework, the state proposes to implement a flexible and adaptive integrated VMS that meets public safety goals and protects and enhances sensitive habitats in the Central Valley. Implementation of the state's approach to levee vegetation management will be adaptive and responsive to (1) the results of ongoing and future research, and (2) knowledge gained from levee performance during high water events.

The state recognizes that woody vegetation on levees must be appropriately managed. The state's levee VMS is focused on improving public safety by providing for levee

integrity, visibility, and accessibility for inspections, maintenance, and floodfight operations; at the same time, it protects important and critical environmental resources.

From a flood threat perspective, lower waterside slope vegetation rarely presents an unacceptable threat to levee integrity. However, lower waterside slope vegetation more typically provides beneficial functions, such as reducing nearshore water velocities and binding soil in place to reduce erosion. Dense riparian brush provides the greatest erosion protection and least levee safety threat.

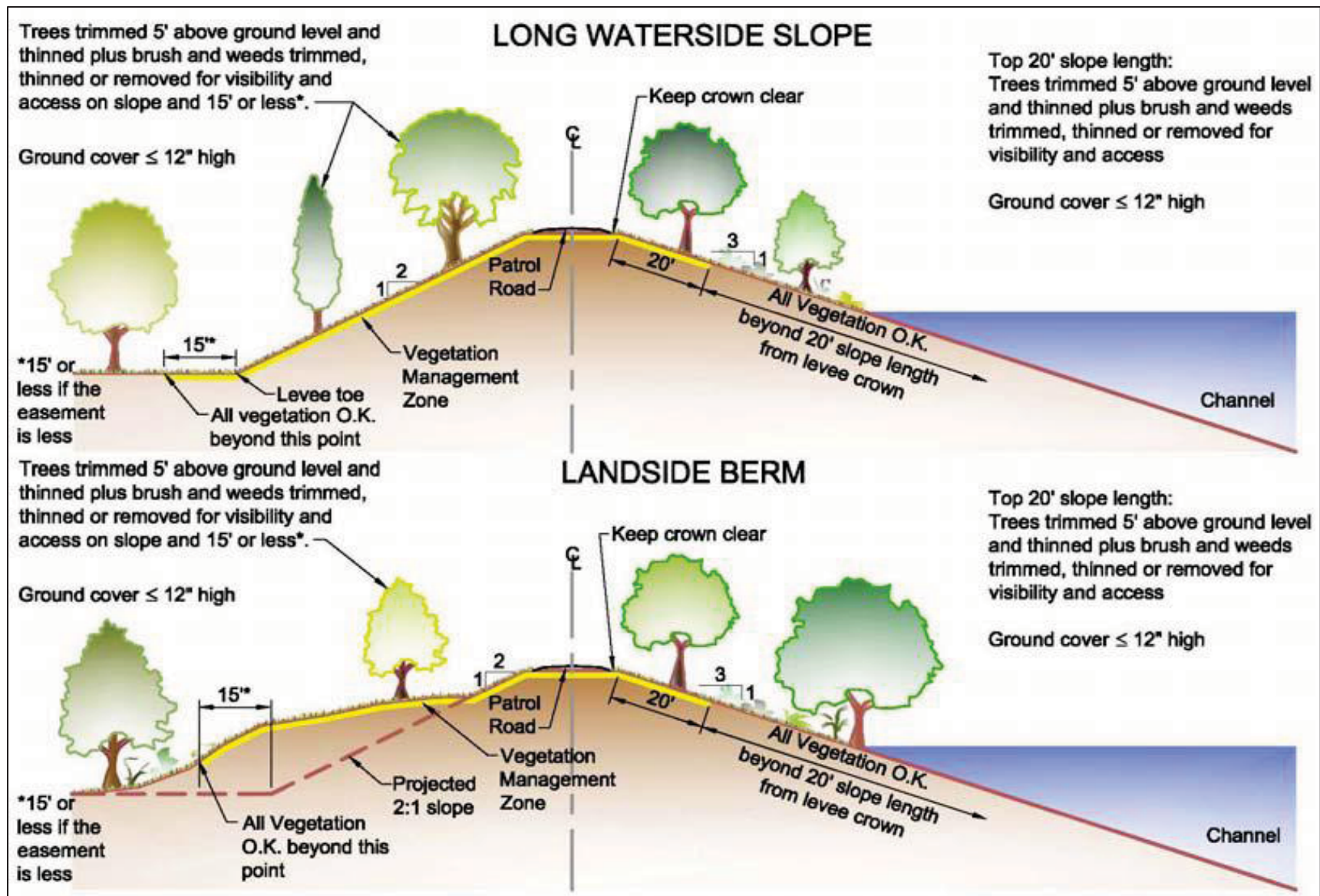
To sustain important habitat, the CVFPP levee VMS retains lower waterside vegetation below the vegetation management zone (see Figures C1 and C2). Vegetation will be removed (in coordination with resource agencies) only when it presents an unacceptable threat. Furthermore, flood management actions will protect existing, and promote the development of, appropriate vegetation for erosion control on the waterside slope, outside of the vegetation management zone.

OPERATIONS AND MAINTENANCE ACTIVITIES NOT REQUIRING BOARD ENCROACHMENT PERMITS

After review of the statutes—in particular, CFR 33, section 208.10 and the Standard O&M Manual for the SRFCP—Board staff concluded that the Board’s regulations as stated in Title 23, section 6(a) of the California Code of Regulations (23 CCR 6[a]) were not intended to require an encroachment permit to plant vegetation that is included as a component of routine maintenance activities.

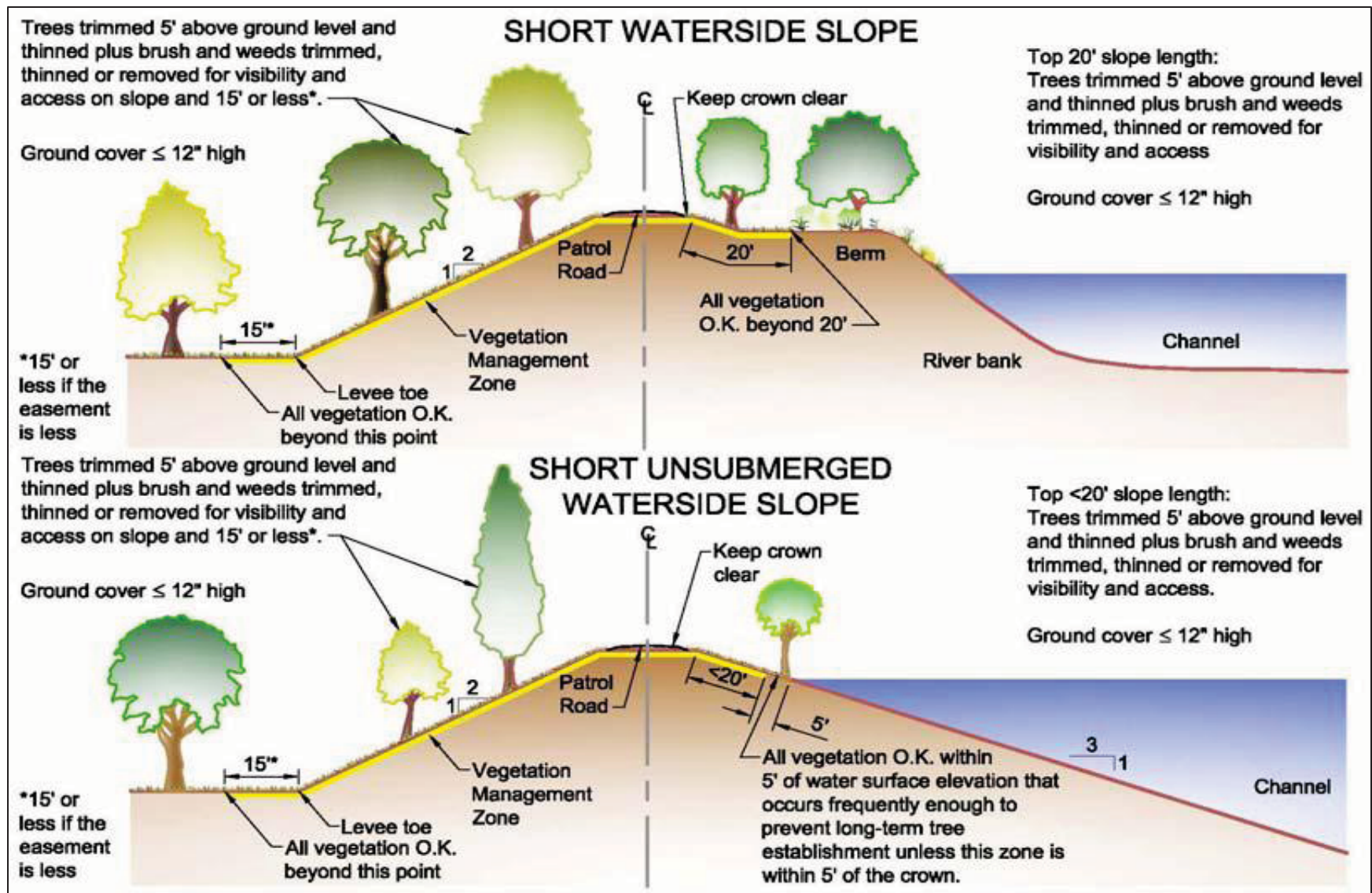
The following code sections are applicable to SERP projects:

- 33 CFR, “Navigation and Navigable Water,” Chapter II, “Corps of Engineers, War Department,” Part 208, “Flood Control Regulations, Maintenance and Operation of Flood Control Works,” section 208.10(b), “Levees (1) Maintenance” states: “The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structure in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees.”
- USACE Standard O&M Manual for the Sacramento River Flood Control Project, section 4.02, “Maintenance” (page 10), paragraph 208.10(b)(1) regarding “Applicable portions of the Flood Control Regulations,” pertaining to maintenance states: “The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structure at the time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees.”



Source: Attachment 2 of the 2012 CVFPP: Conservation Framework Chapter 5.

Figure C1 DWR Vegetation Inspection Criteria for Standard Levees—Long Waterside Slope and Landside Berm



Source: Attachment 2 of the 2012 CVFPP: Conservation Framework Chapter 5.

Figure C2 DWR Vegetation Inspection Criteria for Standard Levees—Short and Short Unsubmerged Waterside Slope

- Section 8361 of the California Water Code (CWC) states: “The department shall maintain and operate on behalf of the state the following units or portions of the works of the Sacramento River Flood Control Project [units and portions of the work not listed in the SERP Manual], and the cost of maintenance and operation shall be defrayed by the state...,” and CWC section 12878, which describes a “maintenance area.”

CONSTRUCTION SEQUENCING

Project construction will be conducted in accordance with the timing provisions outlined in Section I, “Conservation Measures.” Although some of the SERP bank stabilization techniques require plantings and rock revetment to be installed simultaneously, some design applications will allow planting to be delayed until the most appropriate season. DWR will determine the precise planting timelines on a project-by-project basis based on the availability of planting materials, appropriate timing for taking cuttings, capabilities for storage of plant materials, and appropriate timing for planting. For projects where plantings will be installed following project construction, the planting timeline will be specified in the project description section of the project notification form (see Section F, “Notification Requirements”). All planting will be conducted in compliance with the timing provisions outlined in Section I.

CONSTRUCTION MATERIALS AND EQUIPMENT

Project site preparation, and transporting and installing construction materials, will require the use of heavy equipment and motorized vehicles. Variables used to determine the types of equipment to be used include site location and accessibility, proximity to existing or potential staging areas, slope steepness, and whether the damage is at the toe of the levee or nearer to the top. A typical equipment assemblage will include an excavator or back-hoe, crane, dozer, barge or haul truck (end dump or transfer), and water truck or pumps for dust control and compaction.

Rock revetment will be obtained from a commercial source. Fill soil not obtained on-site will also be obtained commercially. Only soil and rock free of waste will be used.

SITE PREPARATION

Site clearing and grading will be conducted in a manner that avoids removal of native vegetation to the maximum extent practicable. Program requirements for removal of existing and non-native vegetation are outlined in Section I, “Conservation Measures.” The conservation measures require that all work will be done in a manner that ensures that any living native riparian vegetation within the vegetation-clearing zones that can be reasonably avoided, without compromising basic engineering design and safety, is avoided and left undisturbed to the extent feasible. No native trees with a trunk diameter at breast height in excess of 3 inches are allowed to be removed or damaged without prior notification and approval by the SERP agencies.

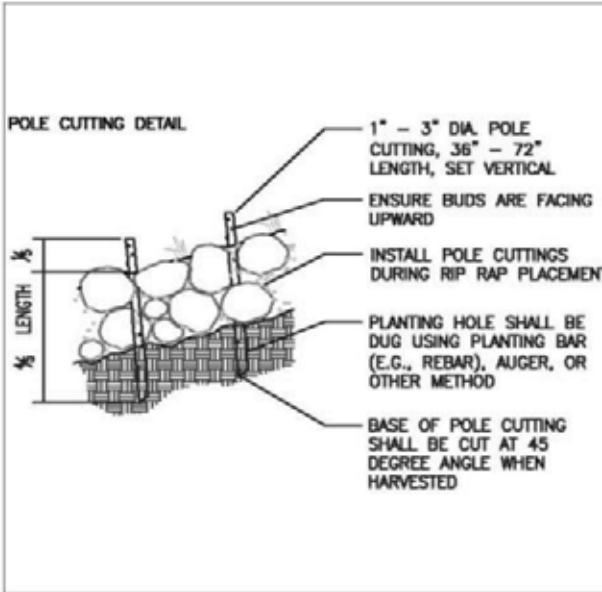
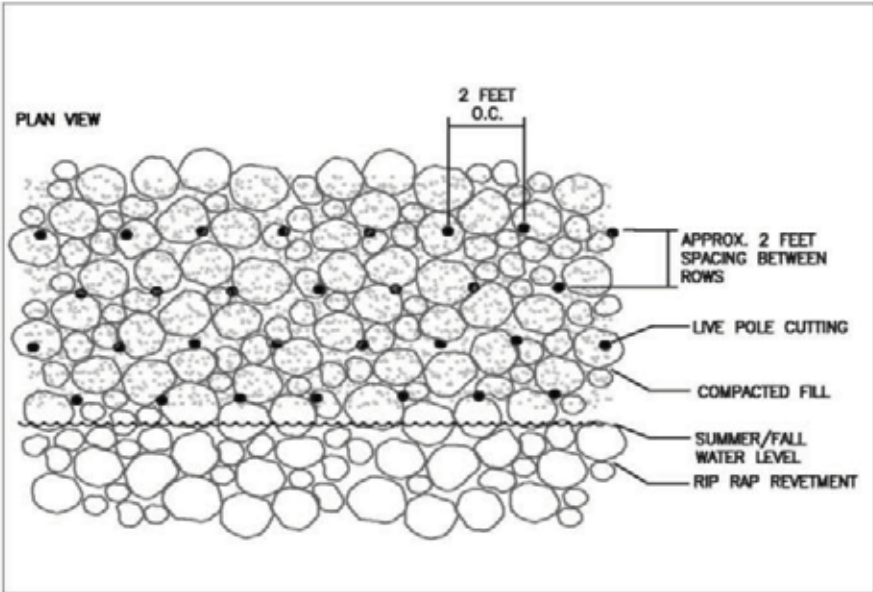
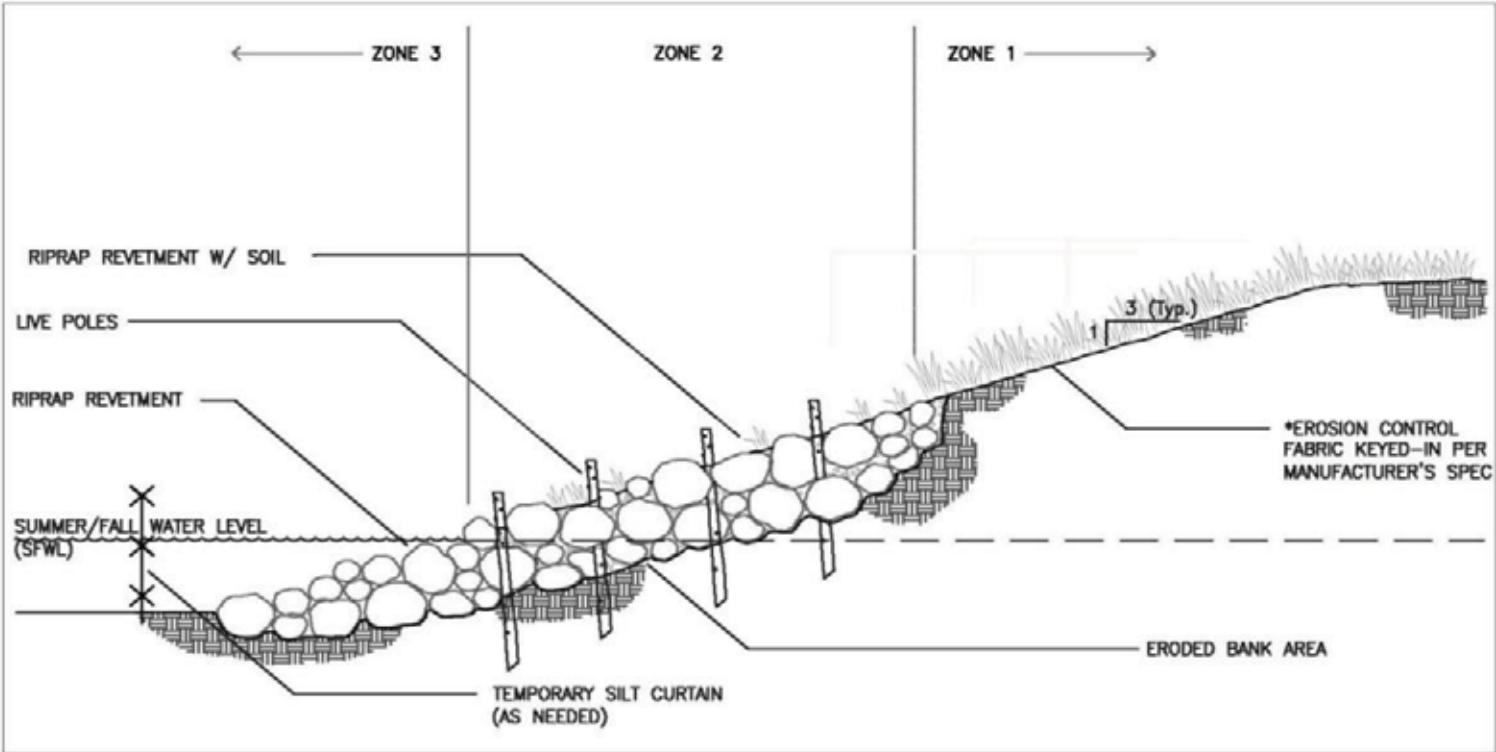
EQUIPMENT STAGING AND ACCESS

For the larger river systems where barge access is possible, a barge will be used for equipment staging and project construction. Barge use is intended to help minimize noise and traffic disturbances and effects on existing landside vegetation. For projects where barge use is not appropriate, construction equipment and plant materials will be staged in designated landside areas adjacent to the project sites. Existing staging sites and maintenance toe and crown roads will be used to the maximum extent possible for project staging and access to avoid adversely affecting previously undisturbed areas.

Depending on the practicality of waterside construction, revetment will either be placed from cranes mounted on barges or from adjacent landside areas using excavators.

Additional program requirements for equipment staging and access are outlined in Section I, "Conservation Measures."

TEMPLATE FOR GUIDANCE ONLY – NOT PROJECT SPECIFIC



BANK FILL ROCK SLOPE WITH LIVE POLE PLANTING

Description and Application:
 Bank fill rock slope with live pole planting is suitable for situations where significant bank erosion has occurred. Rock riprap and soil filled rock is placed in the eroded area and live pole cuttings are installed in the riprap. This technique creates a stable, vegetated bank toe and protected middle and upper bank, and is suitable for banks on inner and outer bends.
 Maximum Slope: 1:1
 Maximum Velocity: Project specific – determined by project engineer specification for rock size.

Limitations:
 Live pole plantings may not be suitable for setback levees and bypass levees that are dry most of the year unless irrigated.

Construction Notes:
 Rock riprap material shall be placed from the toe of the slope to a point at minimum 1'-2' above the Summer/Fall Water Level (SFWL). Riprap revetment with soil shall be installed above the SFWL to facilitate vegetated growth.
 To optimize growth, live woody cuttings should be harvested and installed during the dormant season (i.e., winter). Option: install sonotubes/steel pipes for follow-up winter planting. If live woody cuttings are harvested and installed during the growing season, the receiving site must have consistent water levels sufficient to maintain soil moisture that reaches the cuttings. Live woody cuttings shall be submerged in water for 1-7 days (24 hours min.) prior to installation.
 Disturbed soil shall be seeded with a native perennial grass seed mix (broadcast or hydroseed). When surface vegetation is native species, consider stockpiling topsoil for replacement after construction.

Planting Zones:
 Zone 1 – this zone extends from the top of the levee downslope to the eroded area. The lower extent of Zone 1 is determined by the upper extent of Zone 2 (described below). This zone shall be seeded with native perennial grasses. Woody vegetation shall not be planted in Zone 1. *Use non-monofilament wildlife-safe erosion control fabric.
 Zone 2 – this is the primary woody vegetation planting zone. This zone extends from the SFWL upslope to the point where erosion is not occurring. Live woody cutting growth shall extend to where it would be limited by lack of soil moisture. Live woody cuttings and native perennial grasses may be planted in this zone.
 Zone 3 – this zone extends from the channel bottom up to the SFWL. Live woody cuttings and emergent vegetation may be planted in this zone. Use of soil infill in this zone will be limited by water on some sites.

Plant List and Seed Mix:
 Project-specific plant species and seed mixes will be selected from the plant list included in Section C, "Project Design Templates and Construction Details."

Rock Sizing:
 The project engineer will use the rock sizing chart included in Section C as a guide to determine appropriate rock size and weight based on local scour velocities, with adjustments for bank angle, bend hydraulics, wave exposure, stability factors and safety coefficients.

Compacted Fill:
 Compacted impervious material shall be used to fill large voids on an as-needed basis when directed by engineer per the following:
 IMPERVIOUS MATERIAL: As per CCR Title 23, section 120, ¶ 12.
 COMPACTION REQUIREMENT: As per CCR Title 23, section 120, ¶ 13.

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TEMPLATE 1:
 BANK FILL ROCK SLOPE
 WITH LIVE POLE
 PLANTING

PRELIMINARY
 NOT FOR CONSTRUCTION

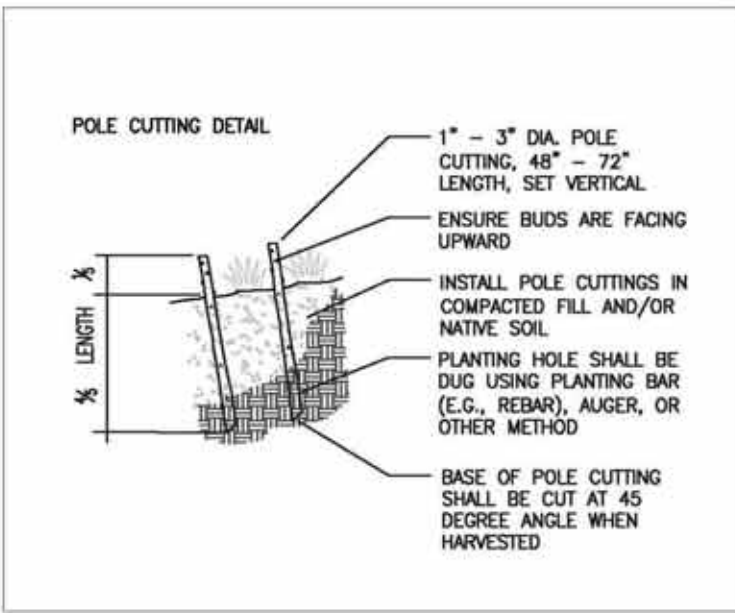
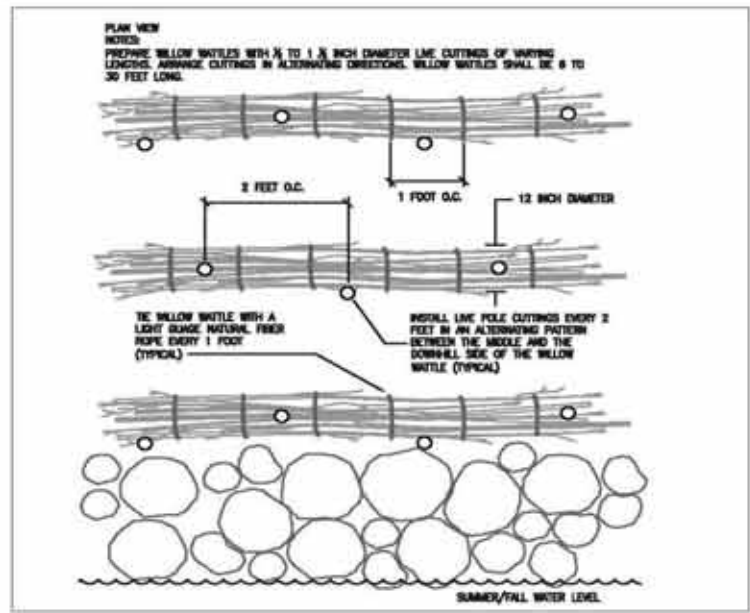
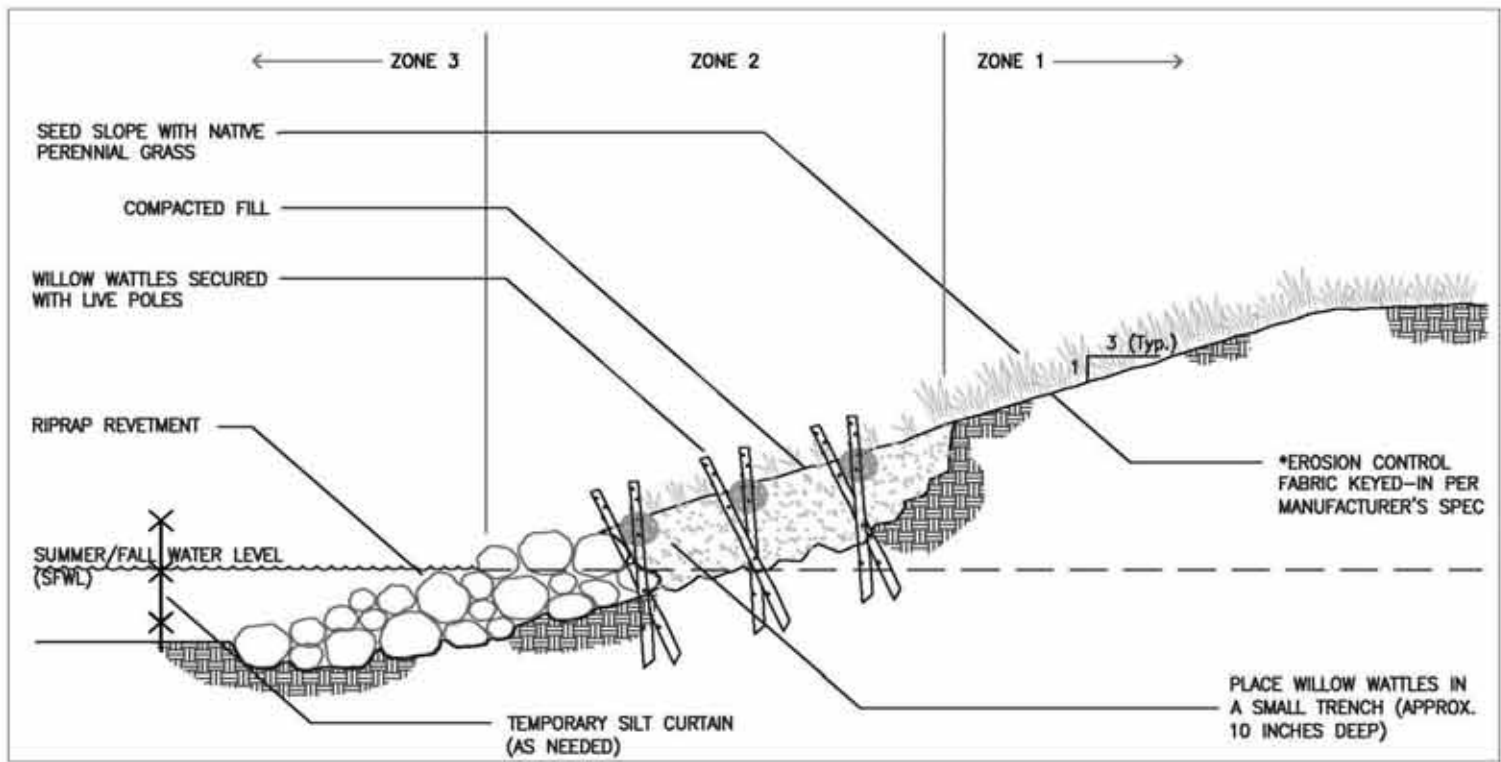
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date: November 4, 2011

Template 1 Bank Fill Rock Slope with Live Pole Planting

TEMPLATE FOR GUIDANCE ONLY – NOT PROJECT SPECIFIC



WILLOW WATTLE WITH ROCK TOE

Description and Application:
 Willow wattles with rock toe is suitable for situations where erosion is primarily caused by runoff on the levee slope. Willow wattles provide protection from erosion caused by runoff on the levee slope, and the rock toe provides protection from erosive flows. Willow Wattle is suitable for shallow (e.g., 3:1) slopes in systems with low-velocity flows.
 Maximum Slope: 2:1
 Maximum Velocity: Project specific – determined by project engineer specification for rock size.

Limitations:
 This technique is not suitable for flashy systems with high peak flows or frequently changing water surface elevations.

Construction Notes:
 Rock riprap material shall be placed from a suitable catch-point on the slope to a point approximately 1'-2' above the Summer/Fall Water Level (SFWL). Willow wattles shall be placed in shallow trenches along the slope and secured with live pole cuttings. Live pole cuttings shall be installed in the center and at the downslope edge of the willow wattle.
 To optimize growth, live woody cuttings should be harvested and installed during the dormant season (i.e., winter). Option: install sonotubes/steel pipes for follow-up winter planting. If live woody cuttings are harvested and installed during the growing season, the receiving site must have consistent water levels sufficient to maintain soil moisture that reaches the cuttings. Live woody cuttings shall be submerged in water for 1-7 days (24 hours min.) prior to installation.
 Disturbed soil shall be seeded with a native perennial grass seed mix (broadcast or hydroseed). When surface vegetation is native species, consider stockpiling topsoil for replacement after construction.

Planting Zones:
 Zone 1 – this zone extends from the top of the levee downslope to the eroded area. The lower extent of Zone 1 is determined by the upper extent of Zone 2 (described below). This zone shall be seeded with native perennial grasses. Woody vegetation shall not be planted in Zone 1. *Use non-monofilament wildlife-safe erosion control fabric.
 Zone 2 – this is the primary woody vegetation planting zone. This zone extends from the SFWL upslope to the point where erosion is not occurring. Live woody cutting growth shall extend to where it would be limited by lack of soil moisture. Live woody cuttings and native perennial grasses may be planted in this zone.
 Zone 3 – this zone extends from the channel bottom up to the SFWL. Live woody cuttings and emergent vegetation may be planted in this zone. Use of soil infill in this zone will be limited by water on some sites.

Plant List and Seed Mix:
 Project-specific plant species and seed mixes will be selected from the plant list included in Section C, "Project Design Templates and Construction Details."

Rock Sizing:
 The project engineer will use the rock sizing chart included in Section C as a guide to determine appropriate rock size and weight based on local scour velocities, with adjustments for bank angle, bend hydraulics, wave exposure, stability factors and safety coefficients.

Compacted Fill:
 Compacted impervious material shall be used to fill large voids on an as-needed basis when directed by engineer per the following:
 IMPERVIOUS MATERIAL: As per CCR Title 23, section 120, § 12.
 COMPACTION REQUIREMENT: As per CCR Title 23, section 120, § 13.

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TEMPLATE 2:
 WILLOW WATTLE WITH
 ROCK TOE

PRELIMINARY
 NOT FOR CONSTRUCTION

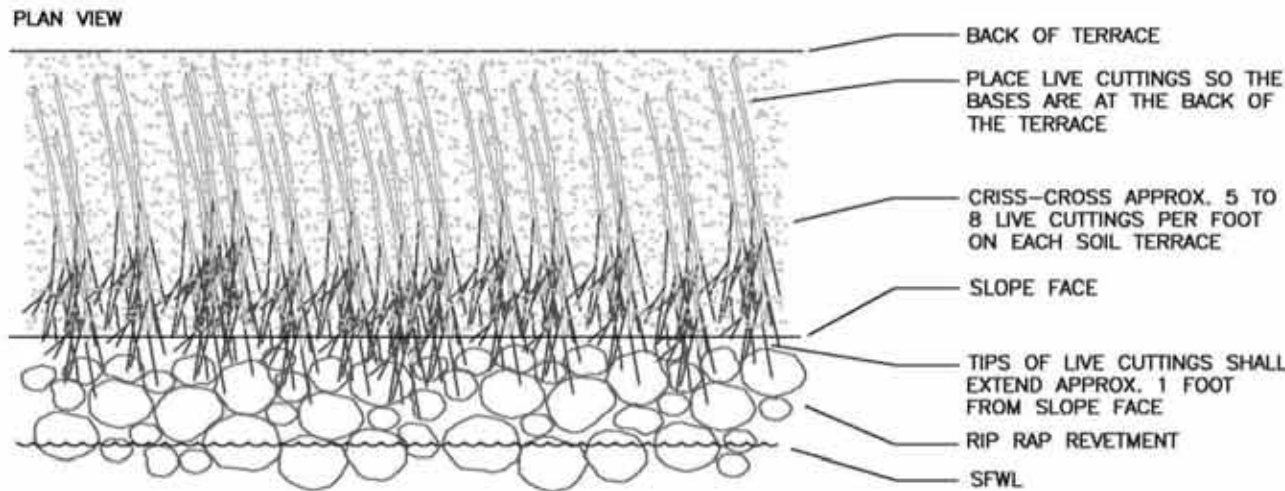
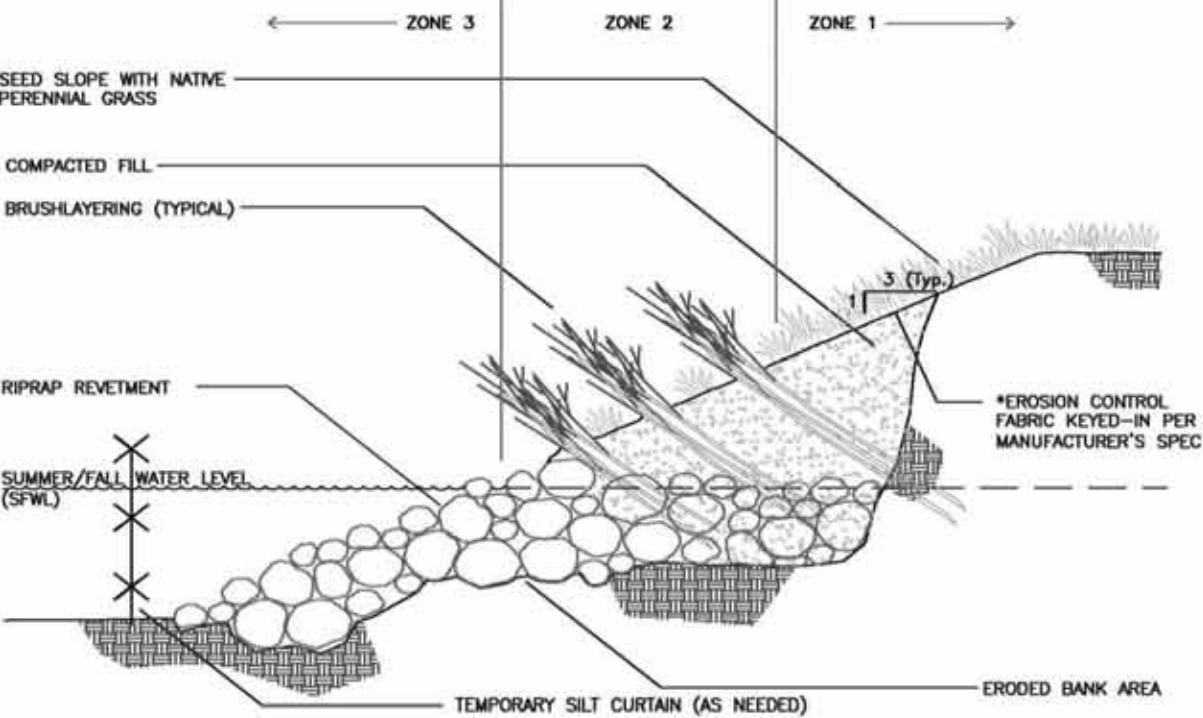
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Template 2 Willow Wattle with Rock Toe

TEMPLATE FOR GUIDANCE ONLY – NOT PROJECT SPECIFIC



BRANCHLAYERING

Description and Application: Branchlayering is layers of live woody cuttings placed in rows running parallel to the channel. The cuttings are installed perpendicular to the slope, between lifts of soil, so that only the tips of the cuttings remain exposed. Live woody cuttings provide protection from erosion caused by runoff on the levee slope, as well as erosion caused by wave action. Branchlayering is suitable for steeper (i.e., 1:1.5 – 2:1) slopes in systems with low-velocity flows.
 Maximum Slope: 1.5:1
 Maximum Velocity: Project specific – determined by project engineer specification for rock size.

Limitations:
 Branchlayering is not suitable for shallow slopes (e.g., 3:1) or upper levee banks.

Construction Notes:
 Rock riprap material shall be placed from the toe of the slope to a point approximately 1'–2' above the Summer/Fall Water Level (SFWL). Alternating layers of Compacted Fill (soil or soil filled rock) and live woody cuttings shall be placed on the rock riprap above the SFWL. Each layer of live woody cuttings shall be watered before the next lift of Compacted Fill is placed on top of it.
 To optimize growth, live woody cuttings should be harvested and installed during the dormant season (i.e., winter). Option: install sonotubes/steel pipes for follow-up winter planting. If live woody cuttings are harvested and installed during the growing season, the receiving site must have consistent water levels sufficient to maintain soil moisture that reaches the cuttings. Live woody cuttings shall be submerged in water for 1–7 days (24 hours min.) prior to installation.
 Disturbed soil shall be seeded with a native perennial grass seed mix (broadcast or hydroseed). When surface vegetation is native species, consider stockpiling topsoil for replacement after construction.

Planting Zones:
 Zone 1 – this zone extends from the top of the levee downslope to the eroded area. The lower extent of Zone 1 is determined by the upper extent of Zone 2 (described below). This zone shall be seeded with native perennial grasses. Woody vegetation shall not be planted in Zone 1. *Use non-monofilament wildlife-safe erosion control fabric.
 Zone 2 – this is the primary woody vegetation planting zone. This zone extends from the SFWL upslope to the point where erosion is not occurring. Live woody cutting growth shall extend to where it would be limited by lack of soil moisture. Live woody cuttings and native perennial grasses may be planted in this zone.
 Zone 3 – this zone extends from the channel bottom up to the SFWL. Live woody cuttings and emergent vegetation may be planted in this zone. Use of soil infill in this zone will be limited by water on some sites.

Plant List and Seed Mix:
 Project-specific plant species and seed mixes will be selected from the plant list included in Section C, "Project Design Templates and Construction Details."

Rock Sizing:
 The project engineer will use the rock sizing chart included in Section C as a guide to determine appropriate rock size and weight based on local scour velocities, with adjustments for bank angle, bend hydraulics, wave exposure, stability factors and safety coefficients.

Compacted Fill:
 Compacted impervious material shall be used to fill large voids on an as-needed basis when directed by engineer per the following:
 IMPERVIOUS MATERIAL: As per CCR Title 23, Section 120, §12.
 COMPACTION REQUIREMENT: As per CCR Title 23, Section 120, §13.

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TEMPLATE 3:
 BRANCHLAYERING

PRELIMINARY
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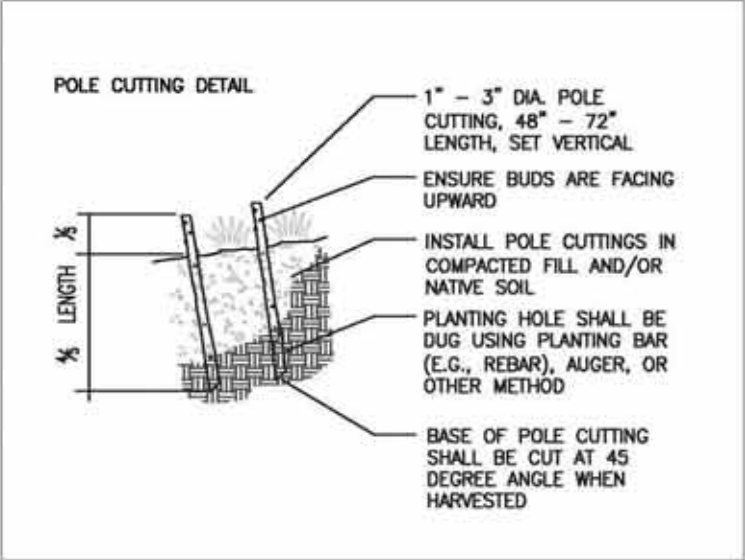
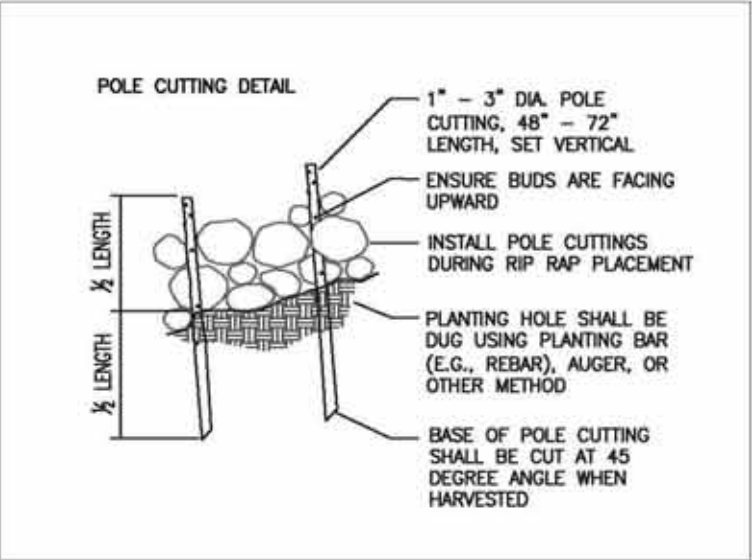
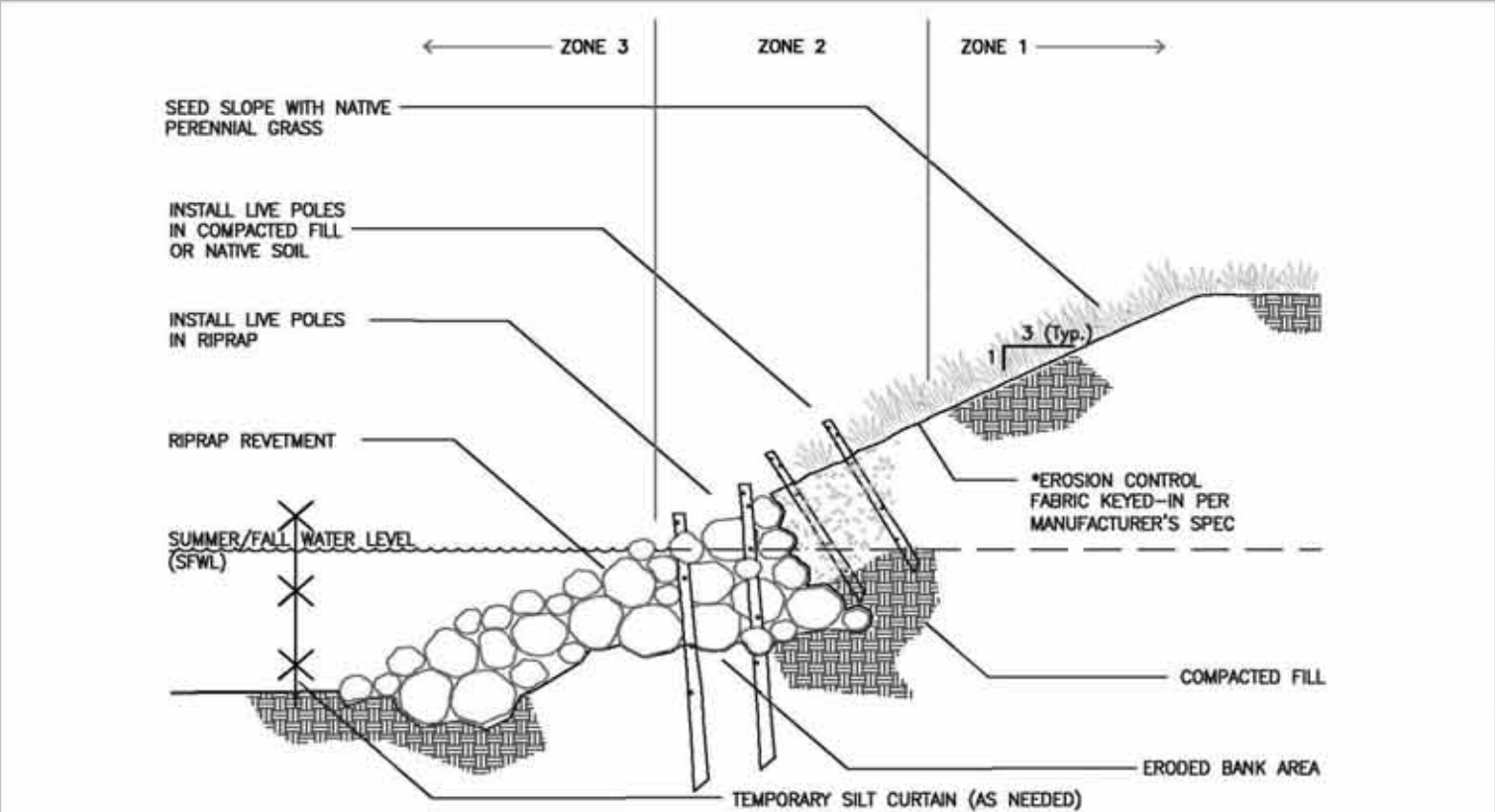
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Template 3 Branch Layering

TEMPLATE FOR GUIDANCE ONLY – NOT PROJECT SPECIFIC



ROCK TOE WITH LIVE POLE PLANTING

Description and Application:
 Rock toe with live pole planting is suitable for situations where typical flows cause erosion at the toe of the bank. Rock riprap is placed in the eroded area and live pole cuttings are installed in the rip rap and compacted or native soil as soil moisture conditions allow. This technique creates a stable, vegetated bank toe and is suitable for banks on inner and outer bends.
 Maximum Slope: 1:1
 Maximum Velocity: Project specific – determined by project engineer specification for rock size.

Limitations:
 This technique is not suitable for flashy systems with high peak flows or frequently changing water surface elevations.

Construction Notes:
 Rock riprap material shall be placed from the toe of the slope to a point at minimum 1'-2' above the Summer/Fall Water Level (SFWL). Riprap revetment with soil shall be installed above the SFWL to facilitate vegetated growth.
 To optimize growth, live woody cuttings should be harvested and installed during the dormant season (i.e., winter). Option: install sonotubes/steel pipes for follow-up winter planting. If live woody cuttings are harvested and installed during the growing season, the receiving site must have consistent water levels sufficient to maintain soil moisture that reaches the cuttings. Live woody cuttings shall be submerged in water for 1-7 days (24 hours min.) prior to installation. Basic steps for construction, including timing, sequencing, materials, equipment, etc.
 Disturbed soil shall be seeded with a native perennial grass seed mix (broadcast or hydroseed). When surface vegetation is native species, consider stockpiling topsoil for replacement after construction.

Planting Zones:
 Zone 1 – this zone extends from the top of the levee downslope to the eroded area. The lower extent of Zone 1 is determined by the upper extent of Zone 2 (described below). This zone shall be seeded with native perennial grasses. Woody vegetation shall not be planted in Zone 1. *Use non-monofilament wildlife-safe erosion control fabric.
 Zone 2 – this is the primary woody vegetation planting zone. This zone extends from the SFWL upslope to the point where erosion is not occurring. Live woody cutting growth shall extend to where it would be limited by lack of soil moisture. Live woody cuttings and native perennial grasses may be planted in this zone.
 Zone 3 – this zone extends from the channel bottom up to the SFWL. Live woody cuttings and emergent vegetation may be planted in this zone. Use of soil infill in this zone will be limited by water on some sites.

Plant List and Seed Mix:
 Project-specific plant species and seed mixes will be selected from the plant list included in Section C, "Project Design Templates and Construction Details."

Rock Sizing:
 The project engineer will use the rock sizing chart included in Section C as a guide to determine appropriate rock size and weight based on local scour velocities, with adjustments for bank angle, bend hydraulics, wave exposure, stability factors and safety coefficients.

Compacted Fill:
 Compacted impervious material shall be used to fill large voids on an as-needed basis when directed by engineer per the following:
 IMPERVIOUS MATERIAL: As per CCR Title 23, Section 120, ¶ 12.
 COMPACTION REQUIREMENT: As per CCR Title 23, Section 120, ¶ 13.

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TEMPLATE 4:
 ROCK TOE WITH LIVE
 POLE PLANTING

PRELIMINARY
 NOT FOR CONSTRUCTION

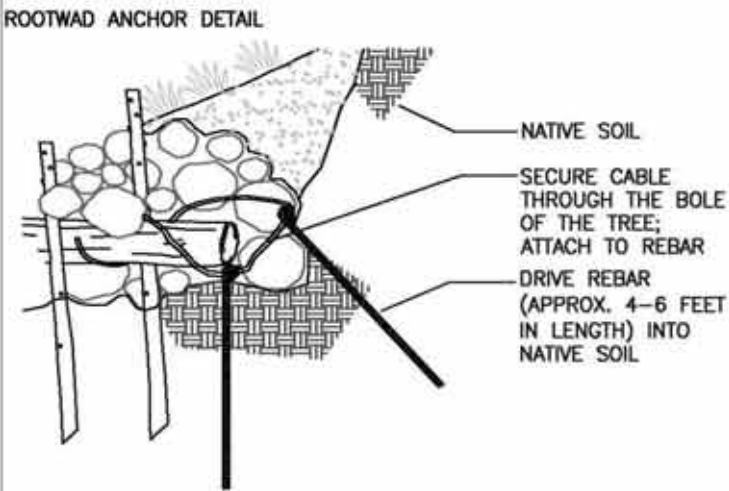
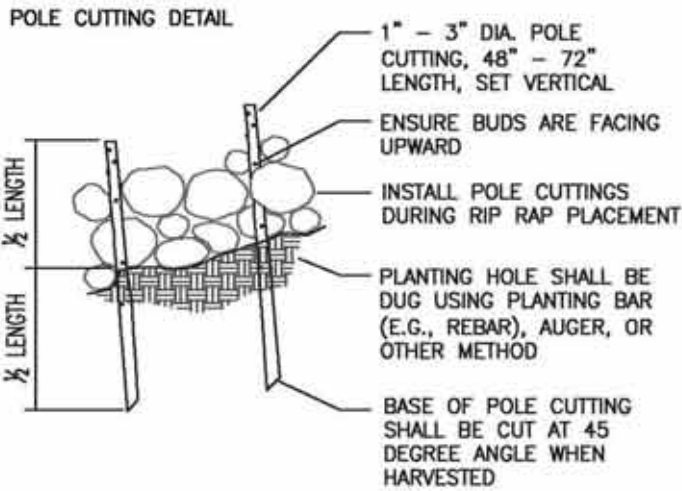
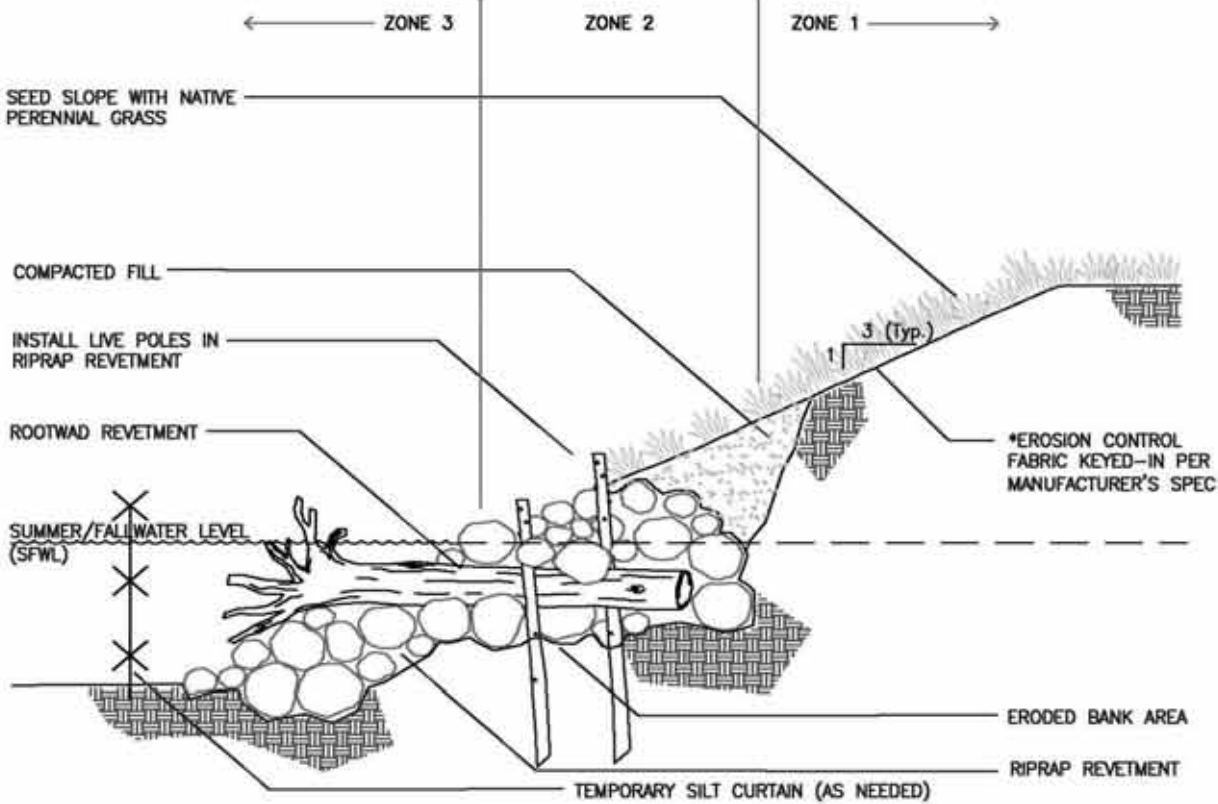
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Template 4 Rock Toe with Live Pole Planting

TEMPLATE FOR GUIDANCE ONLY – NOT PROJECT SPECIFIC



SOIL AND ROCK FILL AT THE BASE OF A FALLEN TREE (W/ ROOTWAD REVETMENT OPTION)

Description and Application:
 There are several repair options for levee banks damaged when a tree has fallen. These are typically small eroded areas. The eroded bank area can be filled with rock riprap and planted with live pole cuttings. Above the Summer/Fall Water Level (SFWL) soil filled rock may be used. In some cases, especially on outside bends, the fallen tree can be used as a rootwad revetment and flow deflector.
 Maximum Slope: 1.5:1
 Maximum Velocity: Project specific – determined by project engineer specification for rock size.

Limitations:
 Rootwad revetments may only be appropriate on natural banks, and should not be installed if there is potential for high flows to cause erosion behind the root fan.

Construction Notes:
 Rock riprap material shall be placed from the toe of the slope to a point at minimum 1'-2' above the SFWL. Riprap revetment with soil shall be installed above the SFWL to facilitate vegetated growth.
 To optimize growth, live pole cuttings should be harvested and installed during the dormant season (i.e., winter). Option: install sonotubes/steel pipes for follow-up winter planting. If live pole cuttings are harvested and installed during the growing season, the receiving site must have consistent water levels sufficient to maintain soil moisture that reaches the cuttings. Live woody cuttings shall be submerged in water for 1-7 days (24 hours min.) prior to installation.
 If conditions allow, the fallen tree shall be pruned and used as a rootwad revetment. The root fan shall be situated to deflect flows downstream. The rootwad shall be anchored into the bank.
 Disturbed soil shall be seeded with a native perennial grass seed mix (broadcast or hydroseed). When surface vegetation is native species, consider stockpiling topsoil for replacement after construction.

Planting Zones:
 Zone 1 – this zone extends from the top of the levee downslope to the eroded area. The lower extent of Zone 1 is determined by the upper extent of Zone 2 (described below). This zone shall be seeded with native perennial grasses. Woody vegetation shall not be planted in Zone 1. *Use non-monofilament wildlife-safe erosion control fabric.
 Zone 2 – this is the primary woody vegetation planting zone. This zone extends from the SFWL upslope to the point where erosion is not occurring. Live woody cutting growth shall extend to where it would be limited by lack of soil moisture. Live woody cuttings and native perennial grasses may be planted in this zone.
 Zone 3 – this zone extends from the channel bottom up to the SFWL. Live woody cuttings and emergent vegetation may be planted in this zone. Use of soil infill in this zone will be limited by water on some sites.

Plant List and Seed Mix:
 Project-specific plant species and seed mixes will be selected from the plant list included in Section C, "Project Design Templates and Construction Details."

Rock Sizing:
 The project engineer will use the rock sizing chart included in Section C as a guide to determine appropriate rock size and weight based on local scour velocities, with adjustments for bank angle, bend hydraulics, wave exposure, stability factors and safety coefficients.

Compacted Fill:
 Compacted impervious material shall be used to fill large voids on an as-needed basis when directed by engineer per the following:
 IMPERVIOUS MATERIAL: As per CCR Title 23, Section 120, § 12.
 COMPACTION REQUIREMENT: As per CCR Title 23, Section 120, § 13.

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TEMPLATE 5:
 SOIL AND ROCK FILL AT
 THE BASE OF A FALLEN
 TREE (W/ ROOTWAD
 REVETMENT OPTION)

PRELIMINARY
 NOT FOR CONSTRUCTION

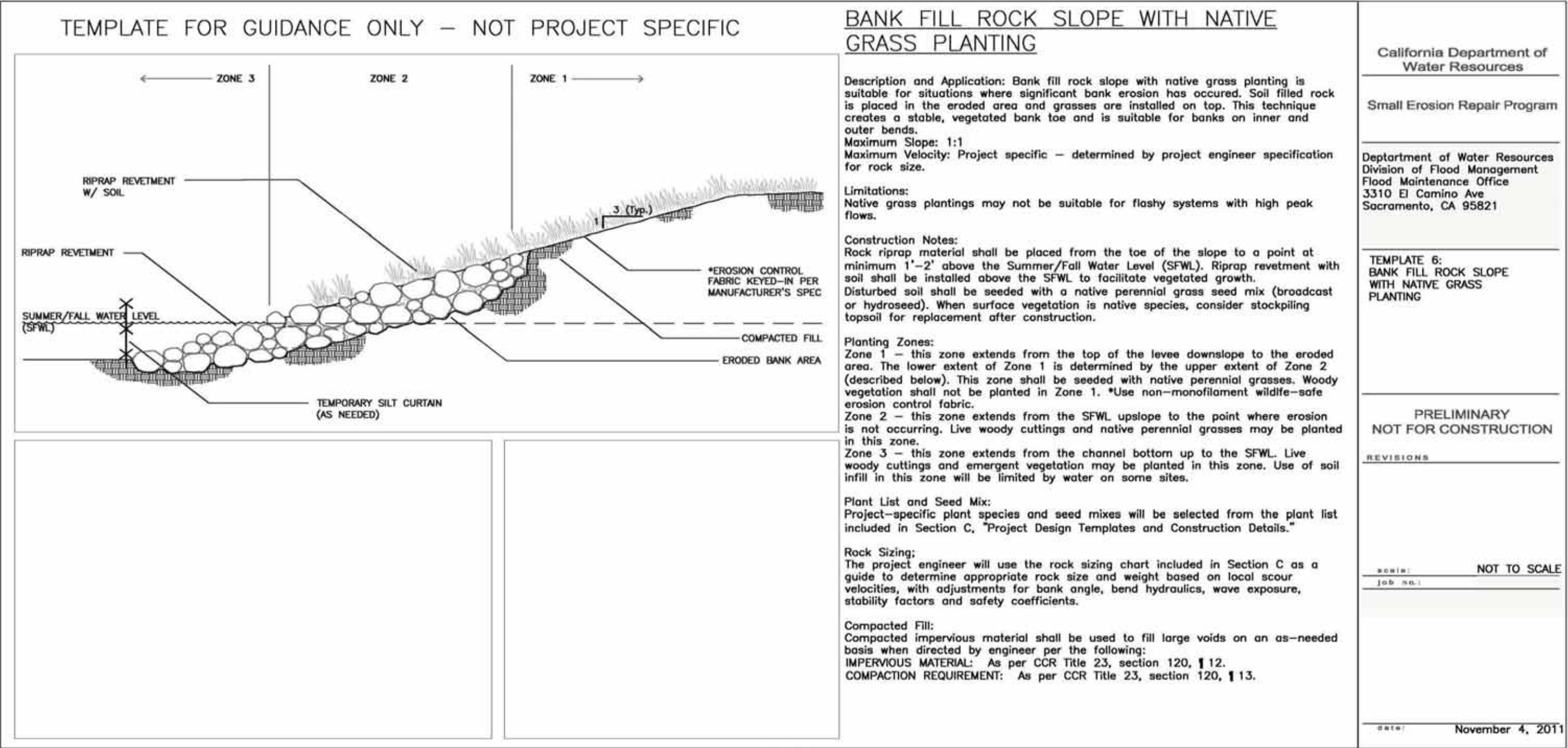
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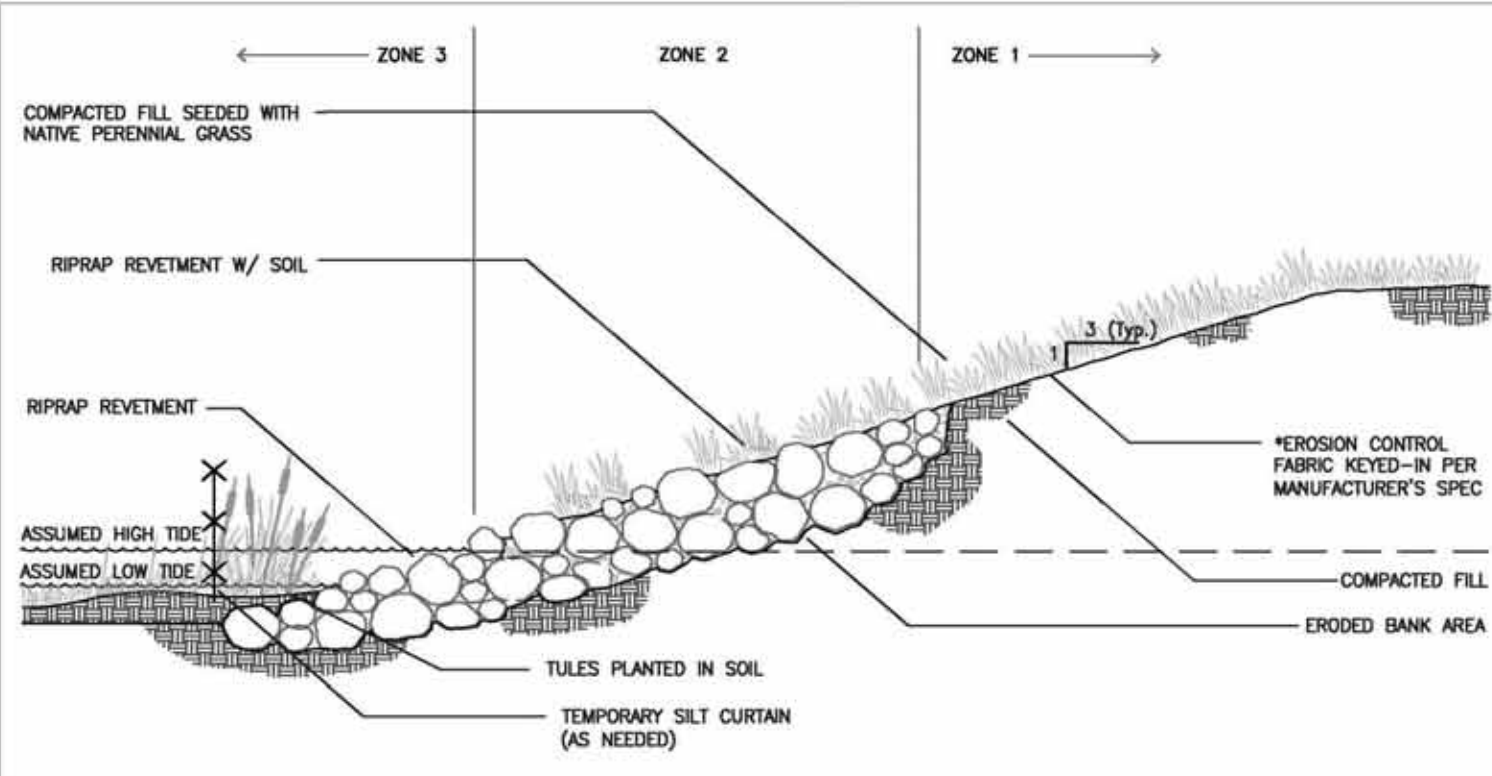
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Template 5 Soil and Rock Fill at the Base of a Fallen Tree (with Rootwad Revetment Option)

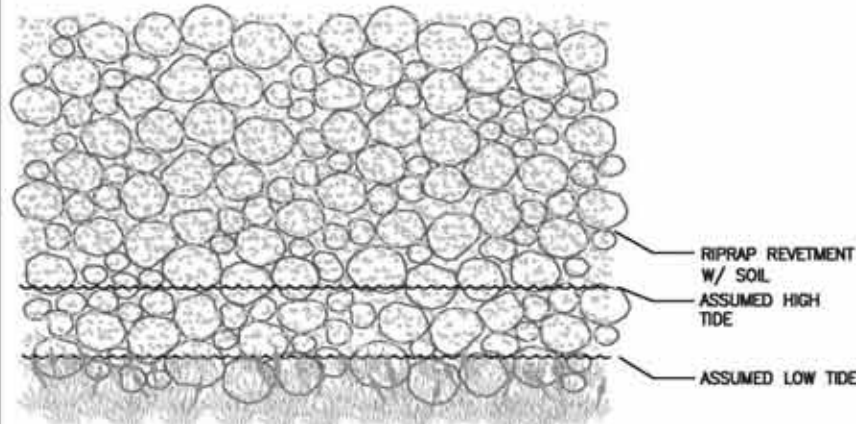


Template 6 Bank Fill Rock Slope with Native Grass Planting

TEMPLATE FOR GUIDANCE ONLY – NOT PROJECT SPECIFIC



PLAN VIEW



BANK FILL ROCK SLOPE WITH EMERGENT VEGETATION PLANTING

Description and Application: Bank fill rock slope with emergent vegetation planting is suitable for situations where significant bank erosion has occurred. Soil filled rock is placed in the eroded area and emergent vegetation is installed typically below low toe. This technique creates a stable, vegetated bank toe and protected middle and upper bank.
 Maximum Slope: 1:1
 Maximum Velocity: Project specific – determined by project engineer specification for rock size.

Limitations:
 For use typically where flatter (10:1) areas allow for emergent vegetation planting.

Construction Notes:
 Rock riprap material shall be placed from just below the low tide point to a point at minimum 1'–2' above the high tide. Riprap revetment with soil shall be installed above high tide to facilitate vegetated growth.
 Disturbed soil shall be seeded with a native perennial grass seed mix (broadcast or hydroseed). When surface vegetation is native species, consider stockpiling topsoil for replacement after construction.

Planting Zones:
 Zone 1 – this zone extends from the top of the levee downslope to the eroded area. The lower extent of Zone 1 is determined by the upper extent of Zone 2 (described below). This zone shall be seeded with native perennial grasses. Woody vegetation shall not be planted in Zone 1. *Use non-monofilament wildlife-safe erosion control fabric.
 Zone 2 – this zone extends from the high tide upslope to the point where erosion is not occurring. Live woody cuttings and native perennial grasses may be planted in this zone.
 Zone 3 – this zone extends from the channel bottom up to the high tide. Emergent vegetation may be planted in this zone.

Plant List and Seed Mix:
 Project-specific plant species and seed mixes will be selected from the plant list included in Section C of the SERP Manual, "Project Design Templates and Construction Details."

Rock Sizing:
 The project engineer will use the rock sizing chart included in Section C as a guide to determine appropriate rock size and weight based on local scour velocities, with adjustments for bank angle, bend hydraulics, wave exposure, stability factors and safety coefficients.

Compacted Fill:
 Compacted impervious material shall be used to fill large voids on an as-needed basis when directed by engineer per the following:
 IMPERVIOUS MATERIAL: As per CCR Title 23, section 120, § 12.
 COMPACTION REQUIREMENT: As per CCR Title 23, section 120, § 13.

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TEMPLATE 7:
 BANK FILL ROCK SLOPE
 WITH EMERGENT
 VEGETATION PLANTING

PRELIMINARY
 NOT FOR CONSTRUCTION

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job no.:

date: November 4, 2011

Template 7 Bank Fill Rock Slope with Emergent Vegetation Planting

D. REGULATORY MECHANISMS

PROGRAM-LEVEL PERMIT PROCESS

This section describes the regulatory mechanisms used by the regulatory and resource agencies to authorize the SERP. Section F, “Notification Requirements,” describes the approval process for individual repairs that qualify for authorization under the program. Agencies with regulatory authority over the SERP include USACE, the Central Valley Regional Water Quality Control Board (RWQCB), the California Department of Fish and Game (DFG), USFWS, NMFS, and SHPO. Figure D1 outlines the SERP programmatic authorization process and provides an estimated schedule for programmatic permit issuance.

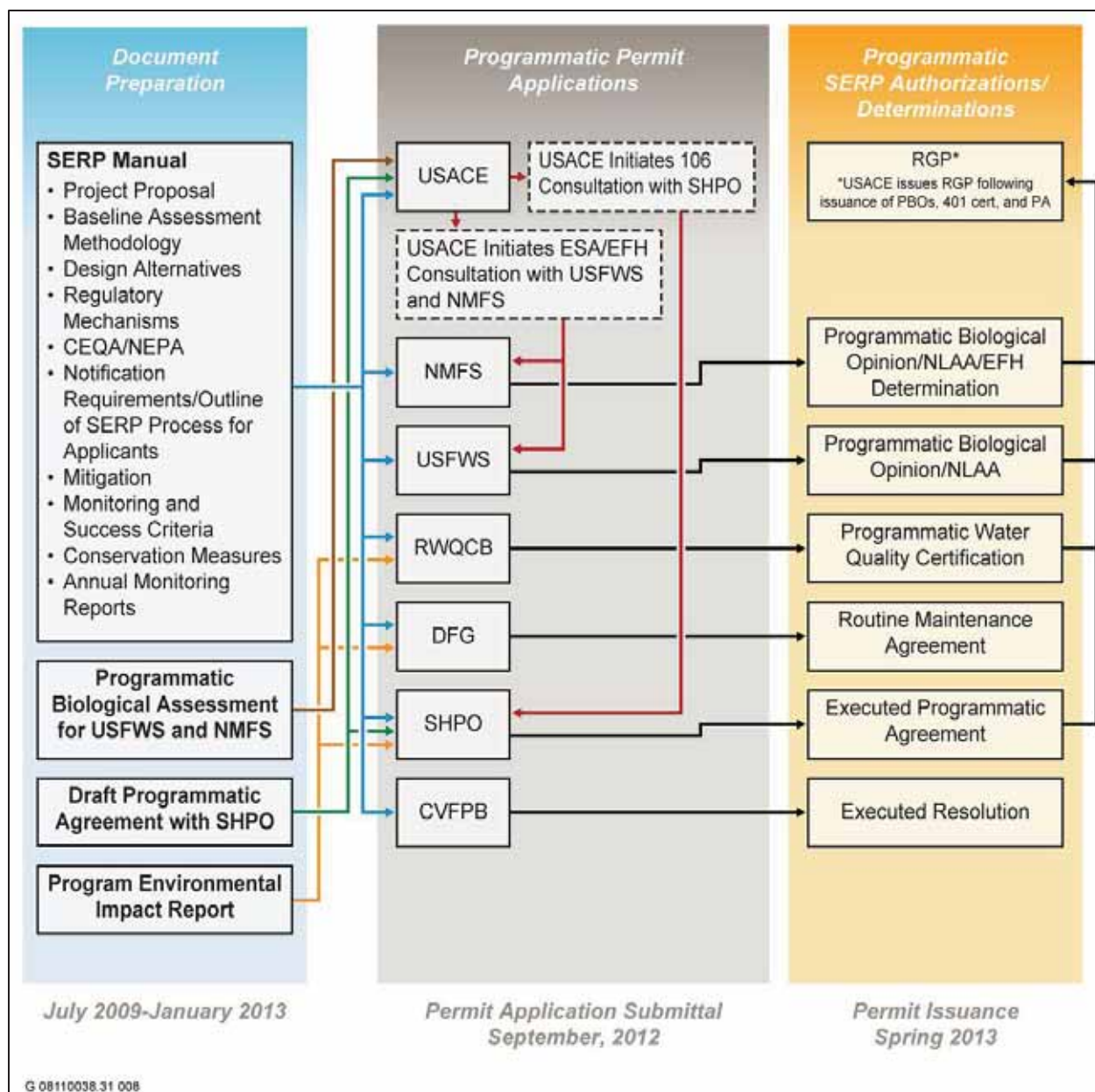
FEDERAL AUTHORIZATIONS

U.S. ARMY CORPS OF ENGINEERS

CLEAN WATER ACT SECTION 404 AND RIVERS AND HARBORS ACT SECTION 10

Section 404 of the Clean Water Act (CWA) prohibits the discharge of dredged or fill materials into waters of the United States, including wetlands, without prior USACE authorization. Section 10 of the Rivers and Harbors Act of 1899 prohibits obstruction or alteration of navigable waters of the United States without prior USACE authorization. In compliance with these statutes, USACE will develop a Regional General Permit (RGP) for the SERP under the authority of CWA section 404 (33 U.S. Code [USC] section 1344) and River and Harbors Act of 1899 section 10 (33 USC section 403), in accordance with provisions of “Regulatory Programs of the Corps of Engineers,” 33 CFR section 323.2(h) for activities which are substantially similar in nature and which cause only minimal individual and cumulative environmental impacts. The RGP will be valid for 5 years from the date of issuance and may be renewed at USACE’s discretion. Compliance with additional regulations, including but not limited to those identified below, will be required by USACE prior to its issuance of the RGP:

- (federal) Endangered Species Act (ESA)
- Fish and Wildlife Coordination Act (FWCA)
- Magnuson–Stevens Fishery Conservation and Management Act (MSA) for Essential Fish Habitat (EFH)
- Marine Mammal Protection Act (MMPA)
- Migratory Bird Treaty Act (MBTA)
- Section 106 of the National Historic Preservation Act (NHPA)



Prepared by AECOM 2010

Figure D1

SERP Development Process Flowchart

- Section 401 of the CWA
- National Environmental Policy Act (NEPA)
- Bald and Golden Eagle Protection Act (BGEPA)

USACE will initiate the ESA, MSA, and NHPA consultations, and initiate coordination under the MMPA and MBTA as part of the RGP permit process. ESA compliance will be achieved through section 7 consultations requested by USACE with USFWS and NMFS as described below; FWCA compliance will be achieved through a FWCA report prepared by USFWS; MSFCMA compliance will be achieved by incorporating RGP special conditions requiring implementation of EFH conservation recommendations provided in the NMFS programmatic biological opinion (BO); MMPA, MBTA, and BGEPA compliance will be achieved through coordination with NMFS and USFWS during the consultation and coordination process; NHPA compliance will be achieved by developing a PA with SHPO, as described below; and compliance with CWA section 401 will be achieved by developing a programmatic 401 water quality certification from the RWQCB, as described below. NEPA compliance will be achieved by USACE preparing an environmental assessment (EA) as part of the RGP process; a finding of no significant impact (FONSI) is anticipated.

U.S. FISH AND WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE

ESA, FWCA, MSA, MMPA, MBTA, AND BGEPA

Once a fish or wildlife species is listed as endangered or threatened under the ESA, the act prohibits anyone from taking the species. To “take” a species means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Habitat modification or degradation that is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat constitutes take. USFWS administers the ESA for terrestrial and freshwater species and NMFS for marine and anadromous fish species. Section 7(a)(2) of the ESA requires federal agencies to consult with USFWS and/or NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions that will adversely affect such species or that may result in take.

As part of the issuance of an RGP, which is the federal nexus for the SERP, USACE will initiate ESA section 7 consultation with both USFWS and NMFS. It is anticipated for SERP that this effort will result in a combined programmatic BO and not likely to adversely affect letter (NLAA) from each of these agencies. The NMFS programmatic BO is anticipated to incorporate conservation recommendations for EFH to comply with the MSA.

Coordination with USFWS and NMFS will include discussion of potential impacts to any species covered by the MMPA and the MBTA. The FWCA provides the basic authority for USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects; thus, USFWS anticipates providing its comments in the

form of a FWCA report. NMFS will provide its comments in a letter. The concerns and/or recommendations of either agency must be addressed.

Authorizations will be valid for an initial period of 5 years. At USACE's request, USFWS and NMFS will review the program for reauthorization in 5 years, concurrent with renewal of the SERP RGP.

STATE AUTHORIZATIONS

CALIFORNIA ENVIRONMENTAL QUALITY ACT

A certified CEQA document will be required for issuance of CWA section 401 water quality certification by the RWQCB and for issuance of a streambed alteration agreement (SAA) by DFG. It has been determined that a PEIR is the appropriate CEQA document for the SERP. As the designated lead agency under CEQA, DWR will prepare a PEIR that identifies the scope of the SERP and probable environmental impacts associated with expected repair projects, as well as the aggregate and cumulative impacts of the SERP to the extent that these impacts can be defined and are not speculative. In addition to providing CEQA coverage for programmatic CWA 401 certification and SAA issuance, the PEIR will provide an avenue for compliance with section 106 of the NHPA and will address potential program-level impacts to state-listed species.

STATE HISTORIC PRESERVATION OFFICER

NATIONAL HISTORIC PRESERVATION ACT SECTION 106

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. USACE has proposed to issue a RGP to DWR to discharge fill to the waters of the United States under authority of CWA section 404 for Phase I of the SERP. USACE must comply with section 106 of the NHPA because an RGP would be an undertaking by USACE as defined under Interim Guidance for Implementing Title 33, CFR Part 325, Appendix C and under Title 36, CFR Part 800.16[y]. Title 33, CFR Part 325, Appendix C establishes the procedures to be followed by USACE to fulfill NHPA requirements. For the SERP, USACE and SHPO will execute a PA using the process defined in 36 CFR Part 800.14 and the procedures defined in 33 CFR Part 325, Appendix C, sections 5 through 15 to satisfy compliance with NHPA section 106. This process allows deferred identification and management of cultural resources under an agreement document. Upon execution (signing and approval) of the PA by the consulting parties, NHPA section 106 compliance will be deemed complete for the purpose of permits and authorizations dependent on the section 106 process. Therefore, PA execution satisfies NHPA section 106 sufficiently to allow USACE to issue an RGP for the SERP and allow DWR and USACE to defer identification and management of historic properties until specific erosion sites require repair.

The PA will provide a process for performing an inventory of cultural resources at specific erosion repair sites as they are identified, evaluating those resources, and resolving any potential adverse effects on significant resources (i.e., historic properties). Notice is required to other potential consulting parties such as the interested public (local historic preservation organizations) and Native American tribes. USACE will provide notice by letter identifying the nature of the federal action and inviting these parties to consult in development of the PA. Coordination with other federal agencies providing permits and authorizations for the SERP will be performed to ensure that the PA identifies these other undertakings, providing a unified compliance framework for compliance with NHPA section 106. The PA will be valid for 5 years and may be renewed at the discretion of USACE and SHPO concurrent with RGP renewal.

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

CLEAN WATER ACT SECTION 401

The RWQCB will develop a programmatic 401 water quality certification to authorize the SERP under section 401 of the CWA. Issuance of the RWQCB water quality certification requires completion of the final PEIR (FPEIR) for compliance with CEQA. The RWQCB will be a Responsible Agency under CEQA. In acting on issuance of the 401 certification, the RWQCB will rely on the PEIR to prepare and issue its own findings regarding the SERP, and to decide whether or not to issue a water quality certification. A draft Programmatic Certification will be circulated for 30 to 60 days for public review and comment. An additional 60 days may be required to schedule a RWQCB meeting if necessary. The Programmatic Certification will be effective for 5 years and may be renewed at the RWQCB's discretion concurrent with renewal of the RGP.

CALIFORNIA DEPARTMENT OF FISH AND GAME

LAKE AND STREAMBED ALTERATION PROGRAM

California Fish and Game Code section 1600 requires notification to DFG before conducting activities that will substantially obstruct or divert natural flow of state waters, substantially change or use materials from a bed, bank or channel, or deposit materials into a river, stream, or lake. DFG will authorize the SERP under an SAA for routine maintenance. The agreement will be valid for 5 years and may be renewed at DFG's discretion. Issuance of the SAA will require certification of CEQA compliance. DFG will be a Responsible Agency under CEQA. In acting on issuance of the SAA, DFG will rely on the PEIR to prepare and issue its own findings regarding the SERP, and to decide whether or not to issue an SAA.

CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act prohibits activities that will result in "take" of state-listed and candidate species without prior DFG authorization through an Incidental Take Permit. California Fish and Game Code section 86 defines take as the act or attempt to "hunt, pursue, catch, capture, or kill." DFG has indicated that with

implementation of recommended conservation measures listed in this SERP Manual, such as appropriate project timing and other avoidance measures, take of state-listed species will likely be avoided. During SERP implementation, if it is determined that a particular project may result in take under the state definition, that project will no longer qualify for authorization under the SERP.

CALIFORNIA STATE LANDS COMMISSION

The California State Lands Commission (SLC) has jurisdiction over certain public lands including sovereign lands that encompass beds of navigable rivers, lakes, and streams. DWR staff will coordinate with the SLC on work within its jurisdictional areas.

CENTRAL VALLEY FLOOD PROTECTION BOARD

The Board has given assurances to USACE that the state will maintain and operate federal flood control works in accordance with federal law pursuant to CWC section 8708. Although the operation and maintenance activities proposed to repair individual SERP sites are generally not the subject of Board review and approval, Board staff does provide oversight for and authorization of maintenance activities from time to time. Because of the unique nature of the SERP program, and to provide an appropriate level of Board oversight, Board Resolution 2012-20 was approved on April 27, 2012, that provides direction to Board staff and informs DWR as to the Board's intent to participate in the SERP program as a state partner. The Board resolved the following:
Deems all SERP program activities to be operations and maintenance activities not requiring Board encroachment permits;

1. Directs Board staff to assist DWR as necessary to finalize the SERP Manual, including geotechnical and hydraulic analysis review procedures, long-term vegetation maintenance procedures, and SERP member agency and public notification procedures;
2. Directs Board staff to prepare Responsible Agency comments pursuant to CEQA when DWR's draft PEIR (DPEIR) is circulated;
3. Directs Board staff to prepare appropriate Responsible Agency findings pursuant to CEQA for Board approval when DWR's FPEIR is circulated;
4. Directs Board staff to review annual SERP repair proposals, and to determine: (A) whether or not each SERP site has been designed according to the SERP Manual, (B) that geotechnical design issues have been considered, (C) that there are no adverse hydraulic impacts, (D) that long-term vegetation management actions have been addressed, and (E) that annual noticing of SERP member agencies and the public is carried out, all in conformance with the SERP Manual;
5. Delegates to the Chief Engineer the authority to execute documents necessary to authorize or reject proposed sites for SERP pilot program repairs consistent with this resolution;

6. Directs Board staff to submit an annual report to the Board on the SERP pilot program including a detailed listing of annually proposed and authorized (or denied) SERP sites at a regular monthly Board meeting as soon as practical after the Chief Engineer's annual determination has been provided to DWR.

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E. CALIFORNIA ENVIRONMENTAL QUALITY ACT/ NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

This section describes how CEQA and NEPA compliance will be achieved for the SERP.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

In accordance with CEQA (Public Resources Code section 21000 et seq.) and the State CEQA Guidelines (CCR section 15000 et seq.), DWR will be preparing a PEIR to evaluate the potential environmental effects associated with Phase 1 of the SERP (i.e., the first 5-year implementation phase by DWR). As mentioned previously, after the Phase 1 implementation period, the Interagency Collaborative Group intends to evaluate the program's success and may expand the SERP to include flood control facilities maintained by various other LMAs. Expansion of the program in later phases may require further analysis under CEQA.

CEQA defines a project as any activity directly undertaken by a public agency that "may cause either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment" (Public Resources Code section 21065). State CEQA Guidelines section 21151(a) specifies that an agency must prepare an environmental impact report for any project that it proposes to carry out or approve that may have a significant impact on the environment.

With the PEIR and corresponding permits, DWR is seeking environmental clearance for multiple sites within the SERP. The PEIR provides one mechanism for obtaining CEQA clearance for multiple sites and expediting work on specific sites once locations subject to erosion repair are identified. Under this approach, DWR will prepare a PEIR that identifies the scope of the SERP and probable environmental impacts associated with expected repair projects, as well as the aggregate and cumulative impacts of the SERP to the extent that these impacts can be defined and are not speculative. The PEIR will be subject to the standard process and public review periods as stipulated in the CEQA statute and State CEQA Guidelines.

In accordance with State CEQA Guidelines section 15082, DWR prepared and issued a notice of preparation (NOP) as notification that a PEIR will be prepared on the SERP. The NOP provides information about the proposed program and its potential environmental impacts so that the Governor's Office of Planning and Research (OPR), responsible and trustee agencies, and interested parties have the opportunity to provide meaningful comments related to the scope and content of the PEIR, including the significant environmental issues, reasonable alternatives, and mitigation measures that a responsible or trustee agency, or OPR, will need to explore in the PEIR (State CEQA Guidelines section 15082[b]).

An initial study has been prepared for the SERP in accordance with State CEQA Guidelines section 15063 and circulated along with the NOP. The initial study identifies the anticipated environmental effects of the program. Based on the results of the initial study, a DPEIR will be prepared. The DPEIR will be focused on several potentially significant environmental impacts associated with implementation of the SERP. Mitigation measures will be recommended wherever feasible to avoid, minimize, rectify, reduce, eliminate, or compensate for potentially significant and significant impacts. Issues to be addressed in the focused PEIR for the SERP include air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, and noise. The combination of the initial study and PEIR satisfy DWR's obligation under State CEQA Guidelines section 15082(a)(1)(C) to identify the "probable environmental effects of the project."

Consistent with the requirements of State CEQA Guidelines section 15126.6, the DPEIR will examine a range of reasonable alternatives to the proposed project that are potentially feasible. As a result of scoping and agency consultation efforts, the alternatives selected for evaluation in the DPEIR include a no-project alternative, a traditional engineered repairs alternative, and a large-scale erosion repair alternative.

The CEQA process must be completed before certain permits can be granted by the reviewing agencies. For example, a certified CEQA document is required for issuance of CWA section 401 water quality certification by the RWQCB and for issuance of the SAA by DFG.

As specific erosion repair sites are identified, DWR will use the CEQA Implementation Checklist provided in Appendix B to determine if a proposed erosion repair project at a given location is consistent with the type and degree of impacts identified in the PEIR. If DWR determines through completion of the checklist that, after implementation of the applicable PEIR mitigation measures, the specific project-level repair work will be consistent with the findings of the PEIR, DWR will retain the checklist as documentation and approve the repair project without a second public review process or preparation of subsequent or supplemental environmental CEQA documents. If the environmental impacts associated with a specific repair project are of a substantially greater magnitude or substantially different than those identified in the PEIR, the project will not qualify for authorization under the SERP. In such cases, DWR will determine and prepare the appropriate document to satisfy CEQA for the individual repair project, and apply for the necessary permits.

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

Issuance of the RWQCB water quality certification will require a FPEIR to comply with CEQA. The RWQCB is a Responsible Agency under CEQA. In acting on issuance of the 401 certification, the RWQCB will rely on the FPEIR to prepare and issue its own findings regarding the SERP, and to decide whether or not to issue water quality certification.

CALIFORNIA DEPARTMENT OF FISH AND GAME

DFG is a Responsible Agency for CEQA compliance as well as a Trustee Agency under CEQA. In acting on issuance of the SAA, DFG will rely on the certified FPEIR to prepare and issue its own findings regarding the SERP, and to decide whether or not to issue a SAA.

CALIFORNIA STATE LANDS COMMISSION

The SLC is a Trustee Agency under CEQA. In acting on the issuance of an agreement or lease, the SLC will rely on the certified FPEIR.

CENTRAL VALLEY FLOOD PROTECTION BOARD

The Board is a Responsible Agency under CEQA. The Board may also prepare and issue its own findings based on the certified FPEIR.

NATIONAL ENVIRONMENTAL POLICY ACT

NEPA evaluation is required when a major federal action, including a permit or approval, is under consideration and may have significant impacts on the quality of the human environment. NEPA compliance will be achieved for the SERP by USACE through preparation of an EA as part of the RGP process. A FONSI is anticipated.

In accordance with USACE's Engineering Regulation 200-2-2 (33 CFR 230), the EA will be a brief document that provides sufficient information to the USACE district commander on potential environmental effects of a proposed action and, if appropriate, its alternatives, for determining whether to prepare an environmental impact statement (EIS) or a FONSI (40 CFR 1508.9). The USACE district commander is responsible for making this determination and for keeping the public informed of the availability of the EA and FONSI.

The EA will include a brief discussion of the purpose and need for the proposed action, or appropriate alternatives if unresolved conflicts exist concerning alternative uses of available resources; the environmental impacts of the proposed action and alternatives; and a list of the consulted agencies, interested groups, and public.

Pursuant to Engineering Regulation 200-2-2 (33 CFR 230), a FONSI will be prepared for a proposed action that is not categorically excluded and for which an EIS will not be prepared. If USACE determines a FONSI is warranted, the FONSI will be a brief summary document, as noted in 40 CFR 1508.13, that constitutes the legal finding that justifies the decision not to prepare an EIS.

The public notice for the SERP RGP will indicate the availability of the EA/FONSI pursuant to the requirements set forth in 40 CFR 1501.4(e)(1).

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F. NOTIFICATION REQUIREMENTS

This section describes the notification and response requirements for repairs that qualify for authorization under the SERP and outlines DWR's process for using the SERP. The section includes the interagency notification checklist to be filled out by DWR for each repair requiring agency notification under the program.

OUTLINE OF DWR'S PROCESS FOR USING THE SERP

ANNUAL PROJECT NOTIFICATION

DWR will provide SERP project notification to the SERP agencies through submittal of an annual SERP project notification package. The package will include individual project application materials for each project proposed for SERP authorization that year. The list of erosion sites will be submitted to DWR engineering and environmental staff by June 1. The engineering and environmental staff will submit the notification package to the SERP agencies' staff by July 1 in anticipation of construction during September and October. Application materials for each project will include:

1. Completed SERP Notification Form
2. Completed Baseline Assessment Checklist
3. Photographs of project site with project foot-print/action area (defined as all APE—access, staging, construction)
4. Project diagrams (i.e., project vicinity map, site plan, cross section)
5. Delineation of special aquatic sites and other waters of the United States and/or the state. Wetland delineations must be prepared in accordance with the current methods and standards required by USACE.
6. Map of adjacent repair locations
7. DFG and the RWQCB only: notification fees
8. A single (for each notification package) completed ENG Form 4345 Application for a Department of the Army Permit

AGENCIES TO BE NOTIFIED

The following agencies will be provided annual SERP project notification packages: USACE, the RWQCB, USFWS, NMFS, the Board, and DFG. The packages will be submitted concurrently to the agency points-of-contact listed below. With the exception of DFG, one application package will be submitted to each agency. For DFG, annual notification packages will be provided to the DFG Regional Office and the DFG SERP contact.

CONTACT INFORMATION

Table F1 provides the contact information for each SERP agency. Unless otherwise directed by the SERP agencies, DWR will submit annual notification packages for proposed SERP projects to the agency addresses identified below. All letters to USFWS need to be addressed to the Assistant Field Supervisor of Endangered Species Division.

Table F1 SERP Agencies Contact Information		
Agency	Address	Phone
USACE	U.S. Army Corps of Engineers Regulatory Division 152 Hartnell Avenue Redding, CA 96002	(d) (530) 223-9534 (f) (530) 223-9539
USFWS	Sacramento Fish and Wildlife Office Endangered Species Program 2800 Cottage Way, Room W-2605 Sacramento, CA 95825	(d) (916) 414-6600 (f) (916) 414-6713
NMFS	National Marine Fisheries Service Protected Resources Division 650 Capitol Mall, Suite 5-100 Sacramento, CA 95814-4708	(d) (916) 930-3600 (f) (916) 930-3629
RWQCB	Central Valley RWQCB Stormwater/Certification Section 11020 Sun Center Drive, Ste. 200 Rancho Cordova, CA 95670-6114	(d) (916) 464-3291 (f) (916) 464-4645
DFG	California Department of Fish and Game North Central Region 1701 Nimbus Road Rancho Cordova, CA 95670	(d) (916) 358-2900 (f) (916) 358-2912
Board	Central Valley Flood Protection Board 3310 El Camino Avenue, Room 151 Sacramento, CA 95821	(d) (916) 574-0653 (f) (916) 574-0682
Source: Data compiled by AECOM in 2012		

AGENCY RESPONSES TO PROJECT NOTIFICATION

Each agency will respond to DWR in writing via letter or e-mail within 30 days of receipt of a complete project notification indicating that it has made one of the following determinations listed below: (For USFWS, NMFS, and the RWQCB, this notification will be provided concurrently to DWR and USACE in the form of an official letter.)

- a) This agency concurs with DWR and, for projects requiring consultation with USFWS and/or NMFS, USACE's determination. and/or agrees that the project qualifies for authorization under the SERP programmatic authorization issued by this agency.

- b) With the additional proposed conservation measures identified, this agency concurs with DWR and USACE's determination and/or agrees that the project qualifies for authorization under the SERP programmatic authorization issued by this agency.
- c) This agency does NOT concur with DWR and, for projects requiring consultation with USFWS and/or NMFS, USACE's determination, and/or the project does NOT qualify for authorization under the SERP programmatic authorization issued by this agency. If an agency does not concur with the determination and/or does not agree that the project qualifies for SERP programmatic authorization, its response will state the reason(s). NMFS or USFWS may recommend initiating ESA section 7 consultation for the proposed action as a stand-alone project.

For projects that may affect federally listed species, USACE will initiate ESA section 7 consultation with USFWS and/or NMFS by letter within 15 days of receiving a complete project notification.

If additional conservation measures are not required by any agency, project activities may commence when all SERP agencies have provided written concurrence that the identified project, as described, qualifies for authorization under the SERP programmatic authorization.

DWR ASSURANCE OF COMPLIANCE WITH ADDITIONAL CONSERVATION MEASURES

If any of the agencies' written concurrences require implementation of additional conservation measures, DWR will respond in writing via e-mail or letter to all of the SERP agencies indicating DWR's agreement to implement the identified additional conservation measures.

NOTIFICATION OF PROJECT CHANGES

In the case where project changes are determined by DWR and USACE to be required following DWR's submittal of the annual project notification packages, DWR will contact, initially by phone, those SERP agencies whose environmental conservation measures will be impacted by this change. A project change is one that falls within the authority of the various agencies and conflicts with conservation measures established under the SERP. DWR will write a "letter-of-change" to the project file for all changes to the project.

PROJECT NOTIFICATION FORM

See the Notice of Intent to Implement an Erosion Repair Project under the SERP and SERP Project Pre-Construction Notification Form on pages F-5 to F-10.

Notice of Intent to Implement an Erosion Repair Project under the SERP

As required by the programmatic authorizations issued for the SERP, the California Department of Water Resources is providing this notification of intent to conduct repairs under the SERP. The project specifics are as follows:

Project and Attachment Checklist

- ☐ CD/DVD of all data/forms, including Google Earth, GIS files of projects.
- ☐ USGS 7.5-minute quadrangle project vicinity map
- ☐ Cross-section of repair (delineate ordinary high-water mark [OHWM], mean high-water mark, and/or high tide line)
- ☐ Site plan diagram

Photographs of Erosion Repair Project Site (label photographs accordingly):

- ☐ Upstream Photograph
- ☐ Downstream Photograph
- ☐ Perpendicular Photograph
- ☐ Map showing species occurrences and/or designated critical habitat and/or essential fish habitat
- ☐ Map showing project footprint including access roads and staging areas
- ☐ Map showing adjacent repairs (within 500 radial feet), if any
- ☐ Project location included in cover letter map of all projects in this SERP packet
- ☐ Delineation of special aquatic sites and other waters of the United States and/or the state
- ☐ Historic Properties report attached
- ☐ Bank Swallow evaluation included for projects north of Knights Landing (SERP Manual BS-1)
- ☐ Number of linear feet of work proposed within Delta smelt critical habitat
- ☐ Agency Response form

SERP PROJECT PRE-CONSTRUCTION NOTIFICATION FORM DWR INFORMATION

Baseline Assessment Information

1. SERP Project Number:			
2. SERP Project Name:			
3. Water Body Name:		<input type="checkbox"/> Levee OR <input type="checkbox"/> River Mile:	
4. Contact Person:	Phone:	Email:	
Address:			
<i>For Reviewing Agency Use Only:</i>			
5. Date assessment was conducted:			
6. Maintenance staff that conducted assessment:			
Phone:		E-mail:	
7. Engineering staff that conducted assessment:			
Phone:		Email:	
8. Environmental staff that conducted assessment:			
Phone:		E-mail:	
9. Directions to Project:			
10. Center Point of Erosion/Project (Lat/Long in decimal degrees):			
11. UTM northing (NAD 83):		UTM easting (NAD 83):	Zone:
12. <input type="checkbox"/> Left Bank OR <input type="checkbox"/> Right Bank		13. <input type="checkbox"/> Outer bend, <input type="checkbox"/> Inner bend, OR <input type="checkbox"/> Straight section	
14. Erosion damage length (feet):	Erosion damage width (feet):	Erosion damage depth/vertical (feet):	Erosion damage (square feet and acres):
15. Description of erosion site:			
16. Description of pre-erosion condition of levee: Describe, for example, whether rock or other structures or facilities were present.			
17. Description of vegetation at erosion site: Provide general overview, for example, "the majority of the upper third of the slope is covered by non-native grasses; extending down the slope to the toe of the levee, perennial pepperweed is the dominant vegetation type; and at the toe, where the slope has sloughed off and the soil has pushed into the low-flow channel, some patchy areas of emergent vegetation, including common tules and cattails, are growing."			

18. Description of vegetation at project staging area and access routes:

19. Description of instream woody material and instream structural elements at erosion site: Describe fallen trees and other instream woody material at the project site. Also describe instream structural elements, such as pump intakes, docks, and other submerged structures that provide flow deflection and hiding cover for fish species. Instream material is considered material that is either crossing the bank or lying adjacent to the bank out to the channel centerline. Describe instream structure as a percentage of the project bank-line length, and provide trunk/stem diameter ranges for woody vegetation.

20. Description of vegetation up- and downstream of erosion site:

21. Sensitive Biological Resources present:

☐ **Yes OR** ☐ **No:** If yes describe known resource issues, such as proximity to known habitat or sightings of giant garter snake, valley elderberry longhorn beetle, Delta smelt, Central Valley Chinook salmon (fall/late-fall run ESU), Chinook salmon (spring/winter run ESU), Central Valley steelhead DPS, North American green sturgeon southern DPS, Swainson's hawk, burrowing owl, bank swallow, nesting birds/migratory birds, raptors, woody shaded riverine habitat.

22. Do irrigation canals or drainage ditches occur within 200 feet of the project site (including staging areas and access routes?)

☐ **Yes OR** ☐ **No** If yes, provide the location and distance (in feet) between the canal and the nearest project site boundary. Example: A 20-foot-wide agricultural irrigation ditch runs along the landside toe of the levee approximately 150 feet from the project site's eastern boundary.

23. Cultural Resources present:

☐ **Yes OR** ☐ **No** If yes, please summarize below and attach report:

24. Adjacent Repairs (within 500 radial feet)

☐ **Yes OR** ☐ **No** If yes fill out boxes below:

SERP Repair?

☐ **Yes OR** ☐ **No**

Distance from this site (feet):

Date repair completed:

Description of adjacent repair:

Conservation measures implemented:

Project Description

25. Project Description:					
26. Start Date:					
27. End Date: (be clear about when construction activities and restoration activities end):					
28.	Project width (feet):	Project depth/ vertical (feet):	Project Area (square feet and acres):	Approximate levee slope at erosion site:	Approximate scour velocity at erosion site:
29. Volume/material excavated (CY):				Volume/material fill (CY):	
30. <input type="checkbox"/> Tier 1 OR <input type="checkbox"/> Tier 2 SERP project					
31. <input type="checkbox"/> Water will OR <input type="checkbox"/> will not be present in work area					
32. Equipment to be used:					
33. Additional project activities outside of the erosion site: Discuss additional project activities that will occur outside of the erosion repair site. Activities such as, but not limited to, excavation of sediment within a portion of the channel that is not part of the levee repair.					
34. Recommended SERP design template (engineering): (Select from Section C, "Project Design Templates and Construction Details," of the SERP Manual):					
35. Rationale for design template selection (engineering): Additionally provide rationale for any deviations from selected templates, i.e., only rock not soil filled rock will be used for slope of the levee, or if vegetation plantings will not be placed used as described in the selected template.					
36. Project Access/Staging: <input type="checkbox"/> Work will include using a barge OR <input type="checkbox"/> Temporary access/staging area					
37. If temporary access/staging area: <input type="checkbox"/> Landside OR <input type="checkbox"/> Waterside location					
38. Access route: Existing roads will be used (dirt or paved) <input type="checkbox"/> Yes OR <input type="checkbox"/> No if no then fill out boxes below:					
39. Access Length (feet):		Access Width (feet):		Acres:	
40. Staging Length (feet):		Staging Width (feet):		Acres:	
41. Will the Access Route and/or Staging Area require grading activities or vegetation disturbance: <input type="checkbox"/> Yes OR <input type="checkbox"/> No: If yes describe activities and amount of vegetation disturbance below:					

42. Instream woody material removal required:

☐ **Yes OR** ☐ **No** If yes describe fallen trees and other instream woody material to be removed, and attach photograph(s). Also describe instream structural elements that require removal, such as pump intakes, docks, and other submerged structures that provide flow deflection and hiding cover for fish species. Instream material is considered material that is either crossing the bank or lying adjacent to the bank out to the channel centerline. Describe instream structure to be removed as a percentage of the total instream structure along the project bank line length, and provide trunk/stem diameter ranges for woody vegetation.

43. Riparian Habitat Impacts:

☐ **Temporary AND/OR** ☐ **Permanent OR** ☐ **No Impact:** For temporary and/or permanent impacts fill out the boxes below:

44. Vegetation Communities Impacted fill in boxes below and to the right	Temporary Impacts	Permanent impacts
	Linear Feet:	Linear Feet:
	Total Area (acres):	Total Area (acres):

45. Are trees to be removed due to project activities?

☐ **Yes OR** ☐ **No** If yes fill out the boxes below:

Tree Species	Number of trees to be removed	Range of Trunk Diameters (DBH) in inches

46. Impacts below the OHWM of waters of the United States and/or the state:

☐ **Temporary AND/OR** ☐ **Permanent OR** ☐ **No Impact:** For temporary and/or permanent impacts fill out the boxes below:

47. Temporary Impact area (type and dimensions): **Permanent Impacts (type and dimensions):**

48. Volume/material excavated (CY): **Volume/material excavated (CY):**

49. Impacts within wetland boundaries:

☐ **Temporary AND/OR** ☐ **Permanent OR** ☐ **No Impact:**

Temporary Impact area (type and dimension): **Permanent Impacts (type and dimension):**

50. Volume/material excavated (CY): **Volume/material excavated (CY):**

51. How was the U.S. Army Corps of Engineers Regulatory Jurisdiction determined:**Tidal Waters:**

☐ **Rivers and Harbors Act section 10 (Mean High Water) AND/OR**

☐ **CWA section 404 (High Tide Line)**

Non-Tidal Waters:

☐ **Rivers and Harbor section 10 (OHWM); AND/OR**

☐ **CWA section 404 (OHWM and/or wetlands)**

52. Potential Federally and State-Listed Species Impacts in the Project Area:

☐ **Yes OR** ☐ **No** If yes list species below, including listing status:

53. Is the Project Area within a designated Essential Fish Habitat and/or Critical Habitat area, and if so, for what species?

☐ **Yes OR** ☐ **No** Please describe below, and indicate on attached map:

54. DFG Check the appropriate box below: **Note: Final determination regarding potential for take of state-listed species to be made by DFG.**

☐ It has been determined that with implementation of the proposed conservation measures the project will not result in take of state-listed species as defined in California Fish and Game Code section 86.

☐ Take of state-listed species may result, a separate 2081 permit is required from DFG, and coverage under the SERP is not available

Reason for decision:

55. NMFS Check the appropriate box below: **Note: Final determination regarding potential for take of federally listed species to be made by USACE**

☐ No effect. NMFS will NOT be consulted [sensitive species/habitat administered by NMFS are not present in the project area and indirect effects will not occur.]

☐ Project may affect, but is not likely to adversely affect, the following federally listed species and qualifies for application of the Programmatic Not Likely to Adversely Affect concurrence letter for the SERP

☐ Project is likely to adversely affect the following federally listed species and qualifies for application of the Programmatic Biological Opinion for the SERP

56. Reason for decision: Provide a rationale for the effects determination for each NMFS-protected species listed in the **'Potential Species Impacts in the Project Area'** box, incorporating information from the **'Sensitive Biological Resources Present'** box.

57. USFWS Check the appropriate box below: **Note: Final determination regarding potential for take of federally-listed species to be made by USACE**

☐ No effect. USFWS will NOT be consulted [sensitive species/habitat administered by the USFWS are not present in the project area and indirect effects will not occur.]

☐ Project may affect, but is not likely to adversely affect, the following federally listed species and qualifies for application of the Programmatic Not Likely to Adversely Affect concurrence letter for the SERP

☐ Project is likely to adversely affect the following federally listed species and qualifies for application of the Programmatic Biological Opinion for the SERP

58. Reason for decision: Provide a rationale for the effects determination for each USFWS-protected species listed in the **Potential Species Impacts in the Project Area** box, incorporating information from the **Sensitive Biological Resources Present** box.

59. Section 106 of the National Historic Preservation Act

DWR has performed an initial review of the proposed erosion repair sites and has attached its findings.

These findings conclude that: Check the appropriate box below:

☐ The repair activities are exempt from further NHPA section 106 review because the proposed activities do not have the potential to affect historic properties. This recommendation is factually supported in the attached memorandum.

☐ The repair activities have the potential to affect historic properties. An inventory report with a map of the area of potential effects (APE) and a finding of effect is attached. The inventory report concludes that the proposed activities will not result in adverse effects either because (a), there are no resources in the APE that qualify as historic properties, or (b), despite the presence of historic properties, the proposed activities are not anticipated to result in adverse effects as demonstrated in the finding of effect statement.

☐ The repair activities have the potential to affect historic properties. An inventory report with a map of the APE and a finding of effect is attached. The inventory report concludes that the proposed activities may result in adverse effects. DWR is including treatment selected from the program HPTP and will coordinate with USACE, SHPO, and relevant Native American tribes regarding treatment options provided in the program HPTP.

60. CEQA Checklist Completed:

☐ **Yes:**

☐ **No:**

AGENCY RESPONSE-To supplement agencies' formal written correspondence

Date:	
Agency:	SERP Project #:
<input type="checkbox"/> This agency concurs with DWR and, if consultation with USFWS and/or NMFS is required, USACE's determination, and/or agrees that the project qualifies for authorization under the SERP programmatic authorization issued by this agency.	
<input type="checkbox"/> With the additional proposed conservation measures identified below, this agency concurs with DWR and USACE's determination and/or agrees that the project qualifies for authorization under the SERP programmatic authorization issued by this agency.	
<input type="checkbox"/> This agency does NOT concur with DWR and, if consultation with USFWS and/or NMFS is required, USACE's determination, and/or the project does NOT qualify for authorization under the SERP programmatic authorization issued by this agency. If an agency does not concur with the determination and/or does not agree that the project qualifies for SERP programmatic authorization, its response will state the reason(s). NMFS or USFWS may recommend initiating ESA section 7 consultation for the proposed action as a stand-alone project.	
Reason for decision:	
Additional Required Conservation Measures:	

DEPARTMENT OF FISH AND GAME RESPONSE:

DATE:

DFG ASSIGNED #

SERP PROJECT #:

- ☐ DFG concurs with DWR that the project described in this SERP Project Pre-Construction Notification qualifies for authorization under the Routine Maintenance Agreement between DFG and DWR for the SERP.
- ☐ With the additional proposed conservation measures identified below, DFG concurs with DWR that the project described in this SERP Project Pre-Construction Notification qualifies for authorization under the Routine Maintenance Agreement between DFG and DWR for the SERP.
- ☐ DFG does NOT concur with DWR. DFG has determined that the project described in this SERP Project Pre-Construction Notification Form does NOT qualify for authorization under the Routine Maintenance Agreement between DFG and DWR for the SERP. DFG will provide DWR written explanation for this non-concurrence finding.

G. MITIGATION

This section describes how mitigation for impacts on biological resources will be accomplished under the SERP. The SERP Subcommittee prioritized avoidance and minimization of adverse impacts to biological resources by applying the SERP project size and placement limits described in Section B, “Baseline Assessment Methodology,” and the conservation measures described in Section I, “Conservation Measures.” Additionally, by implementing timely repairs at small erosion sites under the SERP, further erosion will be prevented and greater impact avoidance will be accomplished with the balance of enhancing the environmental function of the repaired areas.

It is anticipated that SERP projects will generally achieve “self-mitigation” for unavoidable impacts to biological resources through application of the bioengineering erosion control methodologies presented in Section C, “Project Design Templates and Construction Details.” By incorporating vegetation plantings into SERP project design, and monitoring to ensure that the established success criteria are met, aquatic and riparian resource functions are intended to be fully restored with SERP project implementation such that additional compensatory mitigation will not be required.

SELF-MITIGATING PROJECT SITES

SERP project sites will be considered “self-mitigating” if the successful establishment of vegetation plantings incorporated into the project design will restore or enhance the biological function of the existing conditions at the erosion sites. No additional compensatory mitigation will be required for these self-mitigating projects unless the final success criteria are not met. Monitoring of self-mitigating project sites will be conducted in accordance with the monitoring protocol set forth in Section H, “Monitoring and Success Criteria.” Annual reporting for self-mitigating SERP sites will be conducted in accordance with the provisions outlined in Section J, “Annual Monitoring Reports.”

ADDITIONAL COMPENSATORY MITIGATION REQUIREMENTS

In the event that a self-mitigating project site does not meet the final success criteria outlined in Section H, DWR, in coordination with the SERP agencies, may determine that additional, off-site compensatory mitigation is preferable over implementation of contingency actions on-site. This determination must be approved in writing by the agencies and will only be made when DWR has demonstrated a good faith effort to ensure planting success by implementing contingency actions as necessary during the course of the 5-year monitoring period. The agencies may also determine that additional compensatory mitigation is warranted to offset temporal impacts when planting is conducted later than the scheduled planting date provided in the project notification.

If additional compensatory mitigation is determined by the agencies to be warranted, DWR will prepare a site-specific compensatory mitigation plan to address impacts to biological resources based on mitigation ratios determined through coordination with the relevant SERP agencies (e.g., DFG, USFWS for giant garter snake [GGS] habitat

impacts, USACE/RWQCB for waters of the U.S. impacts). The project-specific compensatory mitigation plan will be submitted in draft form to the SERP agencies. The agencies will have opportunity to either approve or provide comments on the draft mitigation plan. Agency comments will be incorporated by DWR into a final mitigation plan, which will be resubmitted to the agencies with a request for written approval.

COMPENSATORY MITIGATION PLAN CONTENT

Regulations at 33 CFR 332.4(c)(ii) stipulate that, for USACE general permits, if compensatory mitigation is required, a final mitigation plan incorporating the elements in paragraphs (c)(2)–(c)(14) of that section, at a level of detail commensurate with the scale and scope of the impacts, must be approved by the district engineer before the permittee commences work in waters of the United States. The USACE Sacramento District Regulatory Division has published *Mitigation and Monitoring Proposal Guidelines* (Appendix A) that provide detailed directions on the preparation of compensatory mitigation plans (USACE 2004).

For the SERP, compensatory mitigation plans prepared in accordance with the mitigation plan requirements for general permits (33 CFR 332.4[c]) and the USACE Sacramento District's *Mitigation and Monitoring Proposal Guidelines* are expected to be sufficient in content and form to suit the mitigation plan requirements of USFWS, NMFS, DFG, and the RWQCB.

SERP project-specific compensatory mitigation plans will incorporate the following elements pursuant to 33 CFR (c)(2)–(c)14, at a level of detail commensurate with the scale and scope of the project impacts:

- **Objectives.** A description of the resource type(s) and amount(s) that will be provided, the method of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed, ecoregion, physiographic province, or other geographic area of interest.
- **Site selection.** A description of the factors considered during the site selection process. This should include consideration of watershed needs, on-site alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site.
- **Site protection instrument.** A description of the legal arrangements and instrument, including site ownership that will be used to ensure the long-term protection of the compensatory mitigation project site.
- **Baseline information.** A description of the ecological characteristics of the proposed compensatory mitigation project site and the impact site. This may include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation

site(s) or the geographic coordinates for those site(s), and other site characteristics appropriate to the type of resource proposed as compensation. The baseline information should also include a delineation of waters of the United States on the proposed compensatory mitigation project site.

- **Determination of Mitigation Ratio.** An explanation of how the compensatory mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity.
- **Mitigation work plan.** Detailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to, the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water, including connections to existing waters and uplands; methods for establishing the desired plant community; plans to control invasive plant species; the proposed grading plan, including elevations and slopes of the substrate; soil management; and erosion control measures. For stream compensatory mitigation projects, the mitigation work plan may also include other relevant information, such as planform geometry, channel form (e.g., typical channel cross sections), watershed size, design discharge, and riparian area plantings.
- **Maintenance plan.** A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.
- **Performance standards.** Ecologically based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives.
- **Monitoring requirements.** A description of parameters to be monitored to determine whether the compensatory mitigation project is on track to meet performance standards and whether adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the USACE district engineer must be included.
- **Long-term management plan.** A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.
- **Adaptive management plan.** A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.
- **Financial assurances.** A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the

compensatory mitigation project will be successfully completed in accordance with its performance standards.

- ***Other information.*** The reviewing agencies may require additional information as necessary to determine the appropriateness, feasibility, and practicability of the compensatory mitigation project.

In addition to including the above elements, compensatory mitigation plans prepared for SERP projects will be prepared in accordance with the objectives of the USACE Sacramento District's *Mitigation and Monitoring Proposal Guidelines* (Appendix A).

H. MONITORING AND SUCCESS CRITERIA

This section describes the monitoring requirements and success criteria for SERP projects. Water quality monitoring required as a standard condition of the programmatic 401 certification is not addressed in this manual.

Monitoring will be conducted by DWR staff to assess the attainment of annual performance goals and final success criteria and to evaluate whether on-site remedial actions or off-site contingency measures should be implemented. Engineering and biological monitoring components are included in the monitoring program to allow for evaluation of project success in meeting both the flood risk reduction and self-mitigation goals of the SERP. Biological monitoring will be conducted for 5 years, or longer as necessary, until the final success criteria are achieved and the agencies have provided written approval.

These monitoring and success criteria apply only to self-mitigating SERP project sites. In the event that a SERP project is determined to require additional, off-site compensatory mitigation as described in Section G, "Mitigation," the required project-specific off-site compensatory mitigation plan will include monitoring and success criteria specific to the off-site mitigation effort.

Maintenance during the Monitoring Period

An important element of mitigation planning is to create, to the extent possible, habitats that are self-sustaining and maintenance free over the long term. Initially, maintenance is often necessary to ensure planting success, but a properly restored riparian area should persist naturally without maintenance. The maintenance and monitoring phase for SERP projects will begin immediately upon project completion. Maintenance activities that focus on maintaining restoration plantings will be conducted for 5 years, or longer as necessary, until the final success criteria are met and the SERP agencies have provided written approval. DWR will be responsible for establishing and maintaining healthy plantings throughout the maintenance/monitoring period.

SERP project site maintenance will include a vegetation management regime to prevent interference with flood management, levee maintenance, inspection, and flood fighting efforts. Vegetation management practices will include regular site inspections and implementation of vegetation management measures such as hand trimming to ensure compliance with the applicable vegetation inspection criteria for standard levees as described in Section C, "Project Design Templates and Construction Details."

Regular levee inspections and maintenance will be conducted in accordance with the applicable USACE O&M manuals as described below. Levee maintenance activities, including vegetation management practices, will be ongoing in accordance with the established O&M procedures.

Once established, SERP project sites are expected to require limited maintenance. During the initial vegetation establishment period, maintenance activities for planted areas are anticipated to include removing invasive vegetation, pruning planted vegetation to comply with USACE vegetation management requirements for levees, and replacing dead plantings. Once the final success criteria are achieved, the vegetation should be self-maintaining.

Scheduled maintenance of the restoration component of SERP projects may require periodic weed control and debris removal. Scheduled levee maintenance will include vegetation management and routine levee maintenance activities as needed. A schedule of proposed, regularly conducted maintenance activities is provided in Table H1.

Table H1 Maintenance Schedule	
Activity	Frequency
Weed/pest observation and removal, and debris removal	Twice per year in late spring and midsummer*
Vegetation management assessments	Once per year in late spring
Routine levee maintenance	Ongoing
Note: * More frequent weed removal may be required to meet annual performance goals. Compiled by AECOM in collaboration with DWR in 2011	

WEED/PEST CONTROL

SERP project sites will be inspected by environmental staff twice annually during the woody and emergent vegetation establishment phase to evaluate potential weed problems. More frequent inspections and weed removal may be required to meet the annual performance goals for woody and emergent native species cover in planted areas. Invasive weed species that show signs of outcompeting installed woody plantings will be removed to ensure the successful establishment and long-term viability of planted woody and emergent vegetation and naturally occurring native woody vegetation. Hand removal of invasive plants and chemical control using spot-spray methods may be used in the event that weed control is necessary in areas planted with woody or emergent vegetation. For application of chemicals, DWR will follow recommendations provided by a certified pesticide control adviser (PCA). Application of chemicals will be conducted in accordance with Conservation Measure CM-11 in Section I, "Conservation Measures."

Mowing is considered another permissible method of weed control on levees. Only methods that do not threaten the long-term viability of the mitigation effort will be used.

The annual inspections will include monitoring for damage caused by insect and other animal pest species. Pest infestations that appear to be impacting the planted

vegetation will be documented, and the information will be provided to the SERP agencies in annual monitoring reports. If necessary, DWR will coordinate with the SERP agencies to identify the best methods for treatment.

DEBRIS REMOVAL

Site clean-up will occur as needed each year during all levee inspections. All trash and debris that washes into or is placed in the project areas will be removed. All garbage, construction debris, other discarded materials, and extraneous equipment will be removed in accordance with California and local regulations. Natural debris such as sticks, twigs, and larger instream woody material will be left untouched. Any clearing of debris and vegetation within the channel as part of flood maintenance will be limited to that debris creating a flood inspection and/or a conveyance impact. This clearing will be performed using hand-clearing methods wherever practical. If equipment use is necessary to remove debris from within the planted area, the equipment will be restricted to the upper levee areas above the riparian zone wherever possible.

ROUTINE LEVEE MAINTENANCE/VEGETATION MANAGEMENT

DWR will continue its program of routine annual levee maintenance in accordance with the applicable USACE standard O&M manuals. Levee maintenance activities described in the O&M manuals include:

- removing debris, spraying herbicides, mowing and burning vegetation on slopes, dragging levee slopes, controlling rodents with rodenticides, grouting rodent holes or other voids in levees, and repairing minor erosion; and,
- managing vegetation with selective cutting, pruning, and spraying of young trees and selective cutting and pruning of the lower branches of mature trees to allow visual inspection of the levee and to maintain channel capacity.

DWR is aware that some of the levee maintenance activities described above (e.g., grouting rodent holes below the OHWM, repairing minor erosion that requires placing fill material below the OHWM, dragging levee slopes) may require separate authorization by the resource agencies.

LONG-TERM VEGETATION MANAGEMENT ON WATERSIDE OF LEVEES

Woody or emergent vegetation installed on the waterside of the levees, as part of the SERP program, will be managed in a manner consistent with the VMS described in the 2012 CVFPP and the associated Conservation Framework; in particular, the lower waterside woody and emergent vegetation will be retained below the vegetation management zone (VMZ). However, certain events may occur in the future where vegetation may be impacted or needs to be impacted. The following strategies will be implemented following events described below:

- In the event subsequent erosion occurs at a SERP site, and the woody or emergent vegetation that was planted on the waterside of the levees is lost due to this erosion, the subsequent repair to the site will use a similar design and will replace, at a one to one (1:1) ratio, the lost vegetation.
- In the event that woody or emergent vegetation grows to extend upslope and into the VMZ, that portion extending into the VMZ will be subject to DWR's continuing program of routine annual levee maintenance in accordance with the applicable USACE standard O&M manuals and the VMS defined in the CVFPP.
- In the event that woody or emergent vegetation planted on the waterside of the levees grows to impede flow, visibility and accessibility for inspections, or maintenance and flood fight operations, DWR will coordinate with the SERP agencies on the best method to correct these impedances.

MONITORING

A primary component of SERP projects is utilization of bioengineered bank stabilization methodologies that result in bank repair sites capable of supporting vegetation and achieving on-site mitigation. Monitoring SERP project sites will allow DWR to evaluate the effectiveness of the repairs from a flood risk reduction and environmental restoration/enhancement perspective.

After the initial plantings are installed, an annual monitoring program will be implemented to determine the site's progress toward meeting the established final success criteria. Mitigation monitoring will be conducted for 5 years, or longer as necessary, until the final success criteria are achieved and the agencies have provided written approval.

SUCCESS CRITERIA

Quantifiable success criteria are used to evaluate mitigation success and to determine completion of mitigation responsibilities. For the SERP, quantitative criteria have been established for the biological component of the project effort. Success of the engineering component in meeting the objectives for reducing flood risks will be qualitatively evaluated by DWR's project engineer. Meeting the engineering objectives and the established success criteria will indicate that the project area is progressing toward replacing or enhancing environmental functions, reducing flood risk, and achieving the long-term self-mitigation goals. Success at averting erosion and subsequent loss of existing habitat adjacent to these repairs will also be considered in determining the success of the overall program in developing sustainable flood corridors.

FINAL SUCCESS CRITERIA

SERP project sites will be considered successfully self-mitigating if they exhibit the following vegetation success criteria by the end of the fifth year after installation, after all construction and remedial actions have been completed:

Percent relative cover of herbaceous* and woody native species = 80 percent

* Areas seeded with native grasses are not subject to native species cover requirement

If these criteria have not been achieved by the end of the 5-year monitoring period, annual monitoring will continue until these criteria have been met unless the SERP agencies determine that modification of the success criteria or off-site compensatory mitigation is warranted based on continued failure after implementation of remedial actions.

In addition to these quantitative criteria, qualitative assessments will include evidence of bank stability, plant health and survival, competition with weedy species, pest infestations (if any), hydrological conditions, signs of herbivory, use by wildlife, and vandalism.

ANNUAL PERFORMANCE GOALS

Table H2 presents the annual performance goals and final success criteria for the biological component of SERP projects. Although achievement of the annual goals is not mandatory, meeting these goals will indicate that the mitigation area is progressing toward achieving the final success criteria; failure to meet the annual goals may indicate a need to implement remedial actions.

Table H2 Annual Performance Goals and Final Success Criteria				
Year	Relative Cover of Planted (not seeded) Herbaceous Native Species (%)	SRA Cover: Relative Cover of Planted Woody Native Species (%)	Herbaceous Species Cover in Seeded Native Grass Areas (%)	Survival of Plantings (% of Original Plantings)
1	90	30	30	70
2	85	40	40	60
3	80	50	50	50
4	80	75	75	N/A
5 (Final Success Criteria)	80	80	80	N/A
Note: SRA = shaded riverine aquatic; N/A = not available Source: Compiled by AECOM in collaboration with SERP Subcommittee in 2011				

MONITORING METHODS

LEVEE MONITORING

Levee maintenance inspections are conducted by DWR in accordance with the standard O&M manual requirements. The inspections are conducted by DWR staff and generally involve driving along levee roads and observing levee conditions. Written inspection logs summarizing the inspection observations are maintained by DWR flood management staff and kept as permanent records.

- In addition to routine levee inspections, DWR environmental staff will conduct a qualitative evaluation of levee conditions at the repair sites as part of the annual monitoring protocol. Environmental staff will provide monitoring data, including photographs, to the DWR project engineer of each repair site for their evaluation and assessment of the engineering component of SERP projects. The environmental staff assessment of the levee condition will be reported on the qualitative evaluation sheet provided at the end of this section.

VEGETATION MONITORING

Vegetation monitoring will consist of both quantitative and qualitative surveys to assess plant survival and percent cover of native vegetation, and qualitative analysis to assess overall conditions and success of the on-site mitigation efforts. Monitoring will be conducted by DWR environmental staff with experience in restoration monitoring. DWR will be responsible for overseeing annual monitoring of the project sites.

Quantitative

Cover-Based Monitoring

A simple quantitative survey of the entire project site will be conducted each year in spring, during the growing season. To calculate percent relative cover for native species, the total cover for all native plants will be summed and divided by the total cover of all plants recorded. This number along with a list of species observed, whether native or nonnative, will be provided to the SERP agencies in the annual monitoring report (see Section J, "Annual Monitoring Reports").

SRA cover will be estimated based on photographs taken from fixed photo points. The SRA photographs and relative cover estimates will be provided to the SERP agencies in the annual monitoring report.

Individual Plant Counts

During the early stages of plant establishment at the project site, individual plant counts will be used to determine the percentage of survival for each species. Although there is no performance standard for percentage of survival, individual plant counts provide an accurate determination of overall plant survival and individual species survival during

the initial stages of plant establishment. Maintaining plant survival is anticipated to facilitate the project site's progress toward achieving the final performance criteria.

All woody plant species will be surveyed and plants will be considered "dead" if there is no live aboveground growth (no green tissue during the growing season). Plant counts will be used during years 1 and 2, and in year 3, if site conditions allow adequate access to individual plantings. If woody plant growth and/or volunteer vegetation make site access difficult and the use of individual plant counts in year 2 or 3 becomes impractical, the percentage of plant survival will be estimated using data collected using the cover-based monitoring methods. Data collected during individual plant counts will be recorded on data sheets and will include information on landscape position and species and general plant vigor.

The recommended performance goals for individual plant counts are 70 percent, 60 percent, and 50 percent survival of all planted woody species during years 1–3, respectively. Maintaining plant survival at these recommended levels is anticipated to facilitate the site's ability to achieve the performance standards in years 4 and 5, whereas failure to achieve these annual survival rates may indicate the need to implement remedial actions.

Qualitative

DWR will conduct qualitative monitoring of the repair sites to assess overall vegetation coverage, general plant health, overall plant community composition, evidence of vandalism, infestations of weeds and/or animal pests, wildlife use, and erosion.

Baseline photographs will be taken at fixed, pre-designated photo points immediately following initial plant installation. The photo points will be selected to provide appropriate views and orientations for a comprehensive assessment of the progress of mitigation efforts over the monitoring period. Photos may be taken on land or from a boat in the channel adjacent to the project levee. At least one on-land photo point will be established at each site for purposes of ground-truthing. The photos will be used to compare and qualitatively assess percent cover of SRA (i.e., installed native woody vegetation) along the levee bank. DWR will also use photographs to assess the general success of the planting effort over the entire site. A qualitative evaluation sheet is provided at the end of this section. The sheet will be completed by DWR environmental staff during the monitoring visit and included in the annual monitoring report.

The photographic record of the site will be kept from the time of the initial planting through the end of the monitoring activities. Each photograph will include the location number and date the photograph was taken. Each year the field notes associated with the photographs will be copied and archived along with the monitoring data and will be available to the SERP agencies upon request. Digital photos of each site will be submitted with the SERP annual monitoring report (see Section J, "Annual Monitoring Reports").

MONITORING SCHEDULE

SERP project sites will be monitored beginning the first spring after installation of the initial plantings. Monitoring will be conducted annually each spring to coincide with the peak growing season. Annual monitoring reports containing the field monitoring data will be prepared by DWR and submitted to the SERP agencies as described in Section J, "Annual Monitoring Reports."

Levee maintenance inspections will be conducted by DWR in accordance with the standard O&M manual requirements as follows:

- during October, which is before the beginning of the flood season;
- immediately following each major high-water period;
- in the absence of high water, at periods not exceeding 90 days; and
- at intermediate times as necessary.

ADAPTIVE MANAGEMENT

REMEDIAL ACTIONS, ON-SITE

If an annual performance goal is not met for a SERP project in any given year or if the final success criteria are not met, DWR will prepare an analysis of the cause(s) of failure. If remedial actions are necessary to ensure final success criteria are met, DWR will propose remedial actions for approval by the SERP agencies. Remedial actions may involve replanting and/or irrigating the site. If the on-site remedial actions are unsuccessful or if site conditions have changed such that on-site mitigation is not practical, DWR may have to propose contingency measures. However, relocating the mitigation site will only be considered by the SERP agencies if on-site remedial actions have been unsuccessful or if site conditions have changed such that on-site remediation is not practical. If a project site has not met the final performance criterion at the end of the 5-year monitoring period, DWR's maintenance and monitoring obligations will continue until the SERP agencies provide final written approval.

CONTINGENCY MEASURES, OFF-SITE

In the event that a self-mitigating project site does not meet the success criteria, DWR, in coordination with the SERP agencies, may determine that additional, off-site compensatory mitigation is preferable over implementation of continued remedial actions on-site. In such cases, DWR will submit a compensatory mitigation plan prepared in accordance with the SERP mitigation plan guidelines outlined in Section G, "Mitigation."

NOTIFICATION OF COMPLETION OF MITIGATION OBLIGATION

At the end of the 5-year monitoring period or when the final success criteria have been met, DWR will provide written notification to the SERP agencies that the mitigation effort

has been successfully completed. This notification will be provided in the final annual monitoring report or in another form of written communication.

SERP AGENCY CONFIRMATION

The SERP agencies may require a site visit to confirm completion of the mitigation effort. Following the site visit, or after receiving written notification of mitigation completion if a site visit is not required, the SERP agencies will confirm in writing that DWR has met the required conditions for final approval. The mitigation requirement will be considered satisfied upon receipt of written approval from all SERP agencies.

SERP PROJECT SITE REVEGETATION QUALITATIVE EVALUATION SHEET

Date:

Monitor Name:

Site Characteristics	Comments/Observations
Vegetation Conditions	
Visual Estimate of Plant Survival (Estimate percentage of surviving plantings; indicate whether mortality is evenly distributed or occurring in a particular portion of the site; state cause of mortality if evident, e.g., herbivory, lack of irrigation)	
General Plant Health and Vigor (Indicate whether healthy/unhealthy plants are evenly distributed or occurring in a particular portion of the site; state cause of unhealthy plants if evident, e.g., disease, insect damage)	
Signs of Native Species Recruitment	
Non-native Vegetation (Note species and density)	
Irrigation Needs	
Shaded Riverine Aquatic	
Visual Estimate of Shaded Riverine Aquatic (SRA) cover and Large Woody Debris (LWD) Conditions (Describe development of SRA overhead cover plantings, persistence of shallow water habitat and installed LWD, generation of LWD from on-site sources, lodging of transported LWD, and use of the site by fish)	
Herbivory	
Insect and/or Rodent Damage	

Levee Condition at Repair Site	
General Condition of Levee Repair (Note whether repair site seems to be intact; report any signs of damage such as sloughing and uprooted trees; if damage from erosion is evident, provide details under "Bank Stability" below.)	
Erosion/Hydrology	
Bank Stability (Estimate percent of bank with active erosion; state cause of erosion if evident, e.g., overbank flow, scouring during high flows)	
Debris (Note type and source)	
Hydrology (Note signs of flooding, past season OHWM, presence of rack or drift line, etc.)	
Wildlife Use	
Species Observed or Signs of Use	
Vandalism/Trespassing	
Indications of Vandalism or Trespassing and Possible Sources (Note, e.g., presence of trash from local fast-food restaurants)	
Recommendations for Remediation	
Recommendations to Address Deficiencies Noted Above	

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I. CONSERVATION MEASURES

This section describes the conservation measures to be applied by DWR, or its construction contractor(s) under DWR's direction, to SERP projects to avoid and minimize impacts on sensitive resources, including federally listed and state-listed species. The SERP conservation measures have been developed based on extensive interagency coordination, pulling from multiple agreements, documents, and policies to develop measures specifically tailored to the SERP.

Measures that will apply to all projects are identified and listed below. Resource-specific measures are also provided in this section and will be applied as determined necessary by DWR in coordination with the appropriate SERP agencies. Resource-specific measures applied to each particular SERP project will be listed on the project notification form included in Section F, "Notification Requirements," of this manual. In completing the notification form, DWR will reference the applicable numbers for the resource-specific conservation measures included in this section and will provide the text of the referenced measures. The only exception to this practice will be for the conservation measures that will be applied to all SERP projects. If DWR proposes implementation of conservation measures not identified in this manual, those measures will be labeled as "Supplemental Conservation Measures" on the project notification form for clarification to the SERP agencies.

Upon receipt of a SERP project notification, agency staff will review the conservation measures listed on the notification form and respond to DWR with any additional conservation measures required for project authorization by their agency. This process is described in Section F of this manual.

MANDATORY CONSERVATION MEASURES TO BE APPLIED TO ALL SERP PROJECTS

The following measures will apply to all SERP projects unless deletion or revision of a measure is approved in writing by all the SERP agencies. The conservation measures listed in this section will not be modified. Modified conservation measures will be listed as "Supplemental Conservation Measures" on the project notification form.

TIMING RESTRICTIONS

CM-1 The following timing restrictions apply to SERP projects within Regions 1–4 as defined below and shown in Figure I1 below:

REGION 1: DELTA-SACRAMENTO RIVER AND MAJOR TRIBUTARIES, RM 0 TO RM 60

Major tributaries include:

- Putah Creek
- Sacramento Bypass

- Portions of Sacramento River downstream of RM 60
- Yolo Bypass, as identified in Figure A1

REGION 2: MAINSTEM SACRAMENTO RIVER AND MAJOR TRIBUTARIES, RM 60 TO RM 143

Major tributaries include:

- Butte Creek
- Cherokee Canal
- Colusa Bypass
- Northern portion of Colusa Main Drain, as identified in Figure A1
- Portions of Feather River, as identified in Figure A1
- Portions of Sacramento River between RM 60 and 143
- Sutter Bypass
- Tisdale Bypass
- Wadsworth Canal
- East and West Interceptor Canals

REGION 3: UPPER SACRAMENTO AND MAJOR TRIBUTARIES, RM 143 TO RM 194

Major tributaries include:

- Portions of Sacramento River between RM 143 and RM 194

REGION 4: NON-ANADROMOUS SERP WATERWAYS, INCLUDING:

- Willow Slough Bypass
- Cache Creek, from the Yolo Bypass to the upstream limit of the SRFCP levees

CM-1(a) Region 1 Timing Restrictions: All in-water construction will occur from August 1 to November 30. The time period for completing work outside the active stream channel is April 15 to October 15 (dates determined by SERP agency collaboration).

CM-1(b) Region 2 Timing Restrictions: All in-water construction will occur from July 1 to October 15. With rare exception, no extensions will be granted on this timing window. The time period for completing work outside the active stream channel is April 15 to October 15 (dates determined by SERP agency collaboration).

CM-1(c) Region 3 Timing Restrictions: All in-water construction will occur from July 1 to August 31. The time period for completing work outside the active stream channel is April 15 to October 15 (dates determined by SERP agency collaboration).

CM-1(d) Region 4 Timing Restrictions: All in-water construction will occur from April 15 to October 1. The time period for completing work outside the active stream channel is April 15 to October 15 (dates determined by SERP agency collaboration). Note: For projects occurring within 200 feet of drainage or irrigation canals that may support GGS, conservation measure GGS-6, which stipulates that **all** project work be completed May 1 to October 1, may be applicable, as determined through coordination with USFWS.

CM-1 (e) Flood Season Timing Restrictions: All work within the floodway will occur from April 15 to November 1. The Board, on prior written request, may allow work to be done during flood season, within the floodway, provided that in the judgment of the Board, forecasts for weather and river conditions are favorable. For the SERP, this written request may be in the form of an e-mail request.

Revegetation and erosion control work that do not involve the use of heavy equipment are not confined to the above timing windows.

CM-2 Timing Extensions for CM-1(a)–(d): Requests for extensions on the above timing windows may be considered by the SERP agencies on a project-by-project basis upon written request from DWR. Requests for timing extensions must include a justification for the request, and any additional information deemed necessary by the agencies. Modifications to the established timing windows may be made only with written concurrence from the SERP agencies.

CM-3: Construction activities will be timed to avoid precipitation and increases in stream flow. If there is a chance of rain within 48 hours, the project site will be prepared with adequate erosion control measures to protect against wind and water erosion. Within 24 hours of any predicted storm event, construction activities within the stream zone will cease until all reasonable erosion control measures, inside and outside of the stream zone, have been implemented.

VEGETATION/HABITAT DISTURBANCE

CM-4: Disturbance to existing grades and vegetation will be limited to the actual site of the project, necessary access routes, and staging areas. The number of access routes, the size of staging areas, and the total area of the project activity will be limited to the minimum necessary to achieve the project goal. All roads, staging areas, and other facilities will be placed to avoid and limit disturbance to stream bank or stream channel habitat as much as possible. When possible, existing ingress or egress points will be used and/or work will be performed from the top of the creek banks or from barges on the waterside of the project levee. Following completion of the work, the contours of the creek bed and creek flows will be returned to preconstruction conditions, or improved to provide increased biological functions.

CM-5: If vegetation removal is required within project access or staging areas, the disturbed areas will be replanted with native species and monitored and maintained to ensure the revegetation effort is successful.

CM-6: If erosion control fabrics are used in revegetated areas, they will be slit in appropriate locations as necessary to allow for plant root growth. Only non-monofilament, wildlife-safe fabrics will be used.

CM-7: To minimize ground and vegetation disturbance during project construction prior to beginning project activities, DWR will establish and clearly mark the project limits, including the boundaries of designated equipment staging areas; ingress and egress corridors; stockpile areas for spoils disposal, soil, and materials; and equipment exclusion zones.

CM-8: Disturbance or removal of vegetation will not exceed the minimum necessary to complete operations. Except for the trees specifically identified for removal in the notification, no native trees with a trunk diameter at breast height in excess of 3 inches will be removed or damaged without prior consultation with and approval by a DFG, USFWS, and NMFS representative. Using hand tools (e.g., clippers, chainsaw), trees may be trimmed to the extent necessary to gain access to the work sites. Work will be done in a manner that ensures that, to the extent feasible, living native riparian vegetation within the vegetation-clearing zones is avoided and left undisturbed where this can reasonably be accomplished without compromising basic engineering design and safety.

CM-9: The amount of rock riprap and other materials used for bank protection will be limited to the minimum needed for erosion protection.

CM-10: All invasive species (e.g., giant reed, *Arundo donax*) will be completely removed from the project site, destroyed using approved protocols, and disposed of in an appropriate upland disposal area.

CM-11: All pesticides/herbicides (pesticides) used to control nonnative vegetation will be used in accordance with label directions. Methods and materials used for herbicide application will be in accordance with DWR's most current guidelines on herbicide use and with laws and regulations administered by the Department of Pesticide Regulation.

Note: Improper application of any pesticides near water can affect fish species and may result in "take" of protected fish as defined under the ESA. To aid in protection of these species, NMFS emphasizes caution and awareness of the following when working near water:

- Label is the law: read and follow the pesticide label.
- Check wind/weather conditions hourly (minimum) or at any observed change.
- Avoid drift: wind can cause drift; adhere to label requirements for wind speed.
- Do not allow spray to drift off target.
- Avoid spraying over or in the water.

- When spraying near the water's edge, spray should be directed away from the water toward the targeted plant.
- Keep all sprayed materials out of the water.
- Use caution and be aware of adjoining areas with potential liability as listed on any attachments.

CONSTRUCTION EQUIPMENT STAGING

CM-12: Construction materials such as portable equipment, vehicles, and supplies, including chemicals, will be stored at designated construction staging areas and on barges, exclusive of any riparian or wetland areas.

CM-13: Barges will be used to stage equipment and construct the project when practical to minimize noise and traffic disturbances and effects on existing landside vegetation. When barge use is not practical, construction equipment and plant materials will be staged in designated landside areas adjacent to the project sites. Existing staging sites, maintenance toe roads, and crown roads will be used to the maximum extent possible for project staging and access to avoid affecting previously undisturbed areas.

MATERIAL STOCKPILING

CM-14: Stockpiling of soil and grading spoils will occur in designated areas on the landside of the levee reaches or on offshore barges. Sediment barriers (e.g., silt fences, fiber rolls, and straw bales) will be installed around the base of stockpiles to intercept runoff and sediment during storm events. If necessary, stockpiles will be covered to provide further protection against wind and water erosion.

EROSION CONTROL DURING CONSTRUCTION

CM-15: There will be no site dewatering activities, including temporary diversion of flows around the work area, unless deemed necessary by DFG and USFWS to avoid impacts to GGS (NOTE: If dewatering is deemed necessary by DFG and USFWS, dewatering activities must be conducted in a manner that does not result in the discharge of fill material into waters of the United States or waters of the state).

CM-16: Erosion control measures (best management practices) that minimize soil or sediment from entering waterways and wetlands will be installed, monitored for effectiveness, and maintained throughout construction operations.

CM-17: If use of erosion control fabrics is necessary, only non-monofilament, wildlife-safe fabrics will be used.

CM-18: DWR will ensure sand, sediment, or sediment-water slurry does not enter the stream channel.

CM-19: No material will be placed in a manner or location where it can be eroded by normal or expected high flows. Jute netting or another non-monofilament erosion control fabric will be used to cover soil that is placed over or mixed into riprap or other revetment materials.

CM-20 Adequate erosion control supplies (e.g., gravel, straw bales, shovels) will be kept at all construction sites during all construction and maintenance activities to ensure that sand and sediments are kept out of any water bodies.

CM-21: Precautions to minimize turbidity/siltation will be taken into account during project planning and will be implemented at the time of construction. This may require placing silt fencing, well-anchored sandbag cofferdams, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to erode into downstream reaches. These barriers will be placed at all locations where the likelihood of sediment input exists and will be in place during construction activities, and afterward if necessary. If any sediment barrier fails to retain sediment, corrective measures will be taken immediately. The sediment barrier(s) will be maintained in good operating condition throughout the construction period and, if necessary, the following rainy season. Maintenance includes, but is not limited to, removing or replacing these barriers. DWR is responsible for removing nonbiodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with vegetation (usually after the first growing season). Upon determination by any of the SERP agencies that turbidity/siltation levels resulting from project-related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation will be halted until effective control devices approved by the determining agency are installed or abatement procedures are initiated.

CM-22: DWR will inspect performance of sediment control barriers at least once each day during construction to they are functioning properly. Should a control barrier not function effectively, it will be immediately repaired or replaced. Additional controls will be installed as necessary.

CM-23: Sediment will be removed from sediment controls once the sediment has reached one-third of the exposed height of the control. Sediment collected in these devices will be disposed of away from the collection site at designated upland disposal sites. The location of the sediment disposal site for the project will be shown on the site plan diagram submitted to the SERP agencies with the project notification.

CM-24: All disturbed soils will undergo appropriate erosion control treatment (e.g., sterile straw mulching, seeding, planting) prior to the end of the construction season, or prior to October 15, whichever comes first.

CM-25: All debris, sediment, rubbish, vegetation, or other material removed from the project site or access or staging areas will be disposed of at an approved disposal site. There will be no sidcasting of material into any waterway.

CM-26: All work pads and other construction items will be removed upon project completion.

CM-27: Upon completion of the construction phase and installation of erosion control materials, the work area within the stream zone will be digitally photographed to document the completed state of the repair site.

HAZARDOUS MATERIALS

CM-28: DWR will exercise every reasonable precaution to protect streams and other waters from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials.

CM-29: Petroleum products, chemicals, fresh cement, and construction by-products containing, or water contaminated by, any such materials will not be allowed to enter flowing waters and will be collected and transported to an authorized upland disposal area. DWR will identify the location of the hazardous materials disposal site as part of the project description information contained in the project notification.

CM-30: Gas, oil, or other petroleum products, or any other substances that could be hazardous to aquatic life and resulting from project-related activities, will be prevented from contaminating the soil and/or entering waters of the state and/or waters of the United States. Any of these materials placed by DWR or any party working under contract or with the permission of DWR below the OHWM or within the adjacent riparian zone, or where they may enter these areas, will be removed immediately. In the event of a spill, work will stop immediately and DFG, USFWS, the RWQCB, NMFS, and USACE will be notified within 24 hours. DWR will implement the spill prevention and control plan (CM-32) and consult with these agencies regarding any additional cleanup procedures. Any such spills and the cleanup efforts will be reported in an incident report and submitted to the SERP agencies.

CM-31: Safer alternative products (such as biodegradable hydraulic fluids) will be used where feasible.

CM-32: A written spill prevention and control plan (SPCP) will be prepared, and the SPCP and all material necessary for its implementation will be accessible on-site prior to initiation of project construction and throughout the construction period. The SPCP will include a plan for the emergency cleanup of any spills of fuel or other material. Employees will be provided the necessary information from the SPCP to prevent or reduce the discharge of pollutants from construction activities to waters and to use the appropriate measures should a spill occur.

CM-33: No solid petroleum products such as asphalt will be used.

CM-34: No concrete or similar rubble will be used.

CM-35: Construction vehicles and equipment will be properly maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease.

CM-36: Heavy equipment will be checked daily for leaks. If leaks are found, the equipment will be removed from the site and will not be used until the leaks are repaired.

CM-37: Equipment other than barges will be refueled and serviced at designated refueling and staging sites located on the crown or landside of the levee and at least 50 feet from active stream channels or other water bodies. All refueling, maintenance, and staging of equipment and vehicles will be conducted in a location where a spill will not drain directly toward aquatic habitat. Appropriate containment materials will be installed to collect any discharge, and adequate materials for spill cleanup will be maintained on-site throughout the construction period.

CM-38: Storage areas for construction material that contains hazardous or potentially toxic materials will have an impermeable membrane between the ground and the hazardous material and will be bermed to prevent the discharge of pollutants to groundwater and runoff water.

OTHER MANDATORY CONSERVATION MEASURES

CM-39: Water (e.g., trucks, portable pumps with hoses, etc.) will be used to control fugitive dust during temporary access road construction.

CM-40: All materials placed in streams, rivers, or other waters will be nontoxic. Any combination of wood, plastic, cured concrete, steel pilings, or other materials used for in-channel structures will not contain coatings or treatments or consist of substances deleterious to aquatic organisms that may leach into the surrounding environment in amounts harmful to aquatic organisms.

CM-41: No materials will be placed in any location or in any manner that will impair the flow of surface water into or out of any wetland area.

CM-42: No fill material other than silt-free gravel or riprap will be allowed to enter the live stream.

CM-43: Water containing mud or silt from construction activities will be treated by filtration, or retention in a settling pond, adequate to prevent muddy water from entering live streams.

CM-44: Screens will be installed on water pump intakes as directed by NMFS salmonid-screening specifications. Where Delta smelt may be present, the intake for water pumps must meet a 0.2 feet per second approach velocity standard.

CM-45: All litter, debris, unused materials, equipment, and supplies that cannot reasonably be secured will be removed daily from the project work area and deposited

at an appropriate disposal or storage site. All trash and construction debris will be removed from the work area immediately upon project completion.

RESOURCE-SPECIFIC CONSERVATION MEASURES TO BE APPLIED AS NECESSARY TO SERP PROJECTS

The following measures are resource-specific and will be applied to SERP projects as determined necessary by DWR in coordination with the appropriate SERP agencies. DWR will identify and list the applicable resource-specific measures for each project on the project notification form, which is included in Section F, "Notification Requirements," of this manual. DWR will reference the applicable numbers for the resource-specific conservation measures used in this section *and* will provide the text of the referenced measures. The conservation measure language included in this section will not be modified. Modified conservation measures will be listed as "Supplemental Conservation Measures" on the project notification forms.

SENSITIVE BIOLOGICAL RESOURCES

SBR-1: A qualified biologist will provide environmental awareness training to workers before project activities begin and will appoint a crew member to act as an on-site biological monitor. The awareness training will include a description of the relevant species and their habitats that are known to occur in the project vicinity and will describe the guidelines that will be followed by all construction personnel to avoid impacts to the species during project activities. A set of guidelines will be provided by DWR to the maintenance crew foreman or contractor(s) participating in the project, and the crew foreman will be responsible for ensuring that crew members comply with the guidelines.

SBR-2: Construction barrier fencing or stakes and flags will be placed around sensitive biological resources located in and within the project site boundaries and will remain in place until all project work involving heavy equipment is complete to ensure that construction activities avoid disturbing these resources. The size of the fenced buffer area will be determined on a project-specific basis through coordination with DFG and/or other relevant resource or regulatory agencies.

SBR-3: A qualified biologist will monitor all construction activities in and within 100 feet of the project site boundaries to ensure that no unauthorized activities occur within the project area. The 100-foot distance may be increased at the direction of a DFG or other agency representative. The biological monitor will be empowered to stop construction activities that threaten to cause unanticipated and/or unpermitted project impacts. Project activity will not resume until the conflict has been resolved. DWR will notify the relevant agency(ies) if the stopped project activity is related to a provision of any SERP permit/authorization.

GIANT GARTER SNAKE

GGs-1: To the extent possible, construction activities will be avoided within 200 feet from the banks of GGS aquatic habitat, including marshes, sloughs, ponds, irrigation

canals, drainage ditches, and flooded rice fields. Movement of heavy equipment in these areas will be confined to existing roadways, where feasible, to minimize habitat disturbance.

GGGS-2: Vegetation clearing will be confined to the minimal area necessary to facilitate construction activities. GGS habitat, including marshes, sloughs, ponds, irrigation canals, drainage ditches, and flooded rice fields, within or adjacent to the project site will be flagged and designated as environmentally sensitive areas. These areas will be avoided by all construction personnel.

GGGS-3: Work crews and contractors will be given environmental awareness training before beginning work on the project site. This training will instruct workers to recognize GGS and its habitats and explain the possible penalties of noncompliance.

GGGS-4: No more than 24 hours prior to construction activities, the project area will be surveyed for GGS by a qualified biologist. Surveys will cover all upland habitat within 200 feet of GGS aquatic habitat and will be repeated if a lapse in construction activity of 2 weeks or greater occurs. If construction activities are proposed within aquatic habitat, the qualified biologist will determine if the habitat could support GGS, and if so, implement measures to exclude GGS from the work area. A GGS-exclusion plan could include measures such as installation of a snake exclusion fence or dewatering the work area (NOTE: Dewatering must be conducted in a manner that does not result in the discharge of fill material into waters of the United States or waters of the state). Any proposed GGS-exclusion plan will be reviewed and approved by DFG, USFWS and NMFS prior to implementation. If a GGS is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. DWR will report any sighting and any incidental take to USFWS immediately by telephone at (916) 414-6600 and to DFG at (916) 358-4353.

GGGS-5: Any temporary fill and construction debris will be removed after completion of construction activities, and, wherever feasible, disturbed areas will be restored to pre-project conditions. Restoration work may include such activities as replanting banks or emergent vegetation in the active channel. Restoration work beyond what is approved under the SERP must be approved by USFWS prior to implementation.

GGGS-6: All construction activity within GGS habitat, including marshes, sloughs, ponds, irrigation canals, drainage ditches, and flooded rice fields, will occur from May 1 to October 1. This includes in-water construction and work outside the active stream channel.

VALLEY ELDERBERRY LONGHORN BEETLE

VELB-1: DWR work crews and contractors will be given environmental awareness training that will emphasize the identification of elderberry shrubs, the need to avoid damaging the elderberry shrubs, and the possible penalties of noncompliance.

VELB-2: Signs will be erected every 50 feet along the edge of elderberry avoidance areas. The signs will include the following information: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the federal Endangered Species Act. Violators are subject to prosecution, fines, and imprisonment.” The signs must be clearly readable from a distance of 20 feet and will be maintained throughout the construction period.

VELB-3: Avoidance areas for valley elderberry longhorn beetle will be temporarily fenced or flagged to serve as a visual boundary and keep people, vehicles, and other sources of disturbance from crossing into the area.

VELB-4: No insecticides, herbicides, fertilizers, or other chemicals that might harm the elderberry shrub or beetle will be used within 100 feet of any elderberry shrub having one or more stems measuring 1.0 inch or greater in diameter at ground level unless written approval for encroachment within the 100-foot buffer has been secured from USFWS. For projects where the application of insecticides, herbicides, fertilizers, or other chemicals may encroach upon the 100-foot buffer from an elderberry shrub, a description of that encroachment, including methods of application and chemicals to be used, will be specified in the project description section of the project notification form (see Section F, “Notification Requirements”) for USFWS review and approval.

VELB-5: When a 100-foot (or wider) buffer is established and maintained around elderberry plants, complete avoidance (i.e., no adverse effects) will be assumed. Where encroachment on the 100-foot buffer has been approved by USFWS, a setback of 20 feet from the dripline of each elderberry plant will be maintained whenever possible. In areas where work will need to occur within the 20-foot setback, a biological monitor will be on site to ensure that no unauthorized take of the beetle or damage to its habitat occurs. Erosion controls will be installed and revegetation with appropriate native seed or plants will be completed on the disturbed areas.

VELB-6: DWR will secure the approval of USFWS prior to working within 100 feet of an elderberry shrub during the flight season of the valley elderberry longhorn beetle (March 15 and June 15).

DELTA SMELT

DS-1: DWR work crews and contractors will be given environmental awareness training that will emphasize the identification of Delta smelt, its habitat needs, and the possible penalties of noncompliance.

SWAINSON’S HAWK

SWH-1: DWR will initiate nest site surveys by March 15 for all projects that are scheduled between March 15 and September 1. All nest sites within 0.5 mile of the project site will be noted and reported to DFG.

SWH-2: DWR will conduct a preconstruction breeding-season (approximately February 1 through August 30) survey of the project site. The survey will be conducted by a qualified biologist and must conform to the Swainson's Hawk Technical Advisory Committee (2000) guidelines. If the protocol-level surveys do not identify any nesting raptor species within the survey area, no further mitigation is required. If nesting raptors are detected, DWR will ensure avoidance by project activities of all active bird nest sites located in the survey area during the breeding season (approximately February 1 through August 30). This avoidance may require a delay of construction to avoid the nesting season. Any occupied nest will be monitored by a qualified biologist to determine when the nest is no longer in use. If construction cannot be delayed, avoidance will include the establishment of a non-disturbance buffer zone around the nest site. The size of the buffer zone will be determined in consultation with DFG.

BURROWING OWL

BO-1: Prior to any ground-disturbing project-related construction activity, a focused survey for burrowing owls will be conducted by a qualified biologist in accordance with DFG protocol (DFG 1995) to identify active burrows on and within 250 feet of the project site. The surveys will be conducted no more than 30 days prior to the beginning of construction. If no occupied burrows are found in the survey area, no further mitigation is required. If an occupied burrow is found, a buffer will be established—165 feet during the nonbreeding season (September 1 through January 31) or 250 feet during the breeding season (February 1 through August 31)—for all project-related construction activities. The size of the buffer area may be adjusted if a qualified biologist and DFG determine project-related construction activities are not likely to have adverse effects. No project-related construction activity will commence within the buffer area until a qualified biologist confirms that the burrow is no longer occupied, or until consultation with DFG specifically allows certain construction activities to continue. If avoidance of occupied burrows is infeasible for project-related construction activities, on-site passive relocation techniques approved by DFG will be used to encourage owls to move to alternative burrows outside of the project site. However, no occupied burrows will be disturbed by project-related construction activities during the nesting season unless a qualified biologist verifies through noninvasive methods that the burrow is no longer occupied.

BANK SWALLOW

BS-1: For any SERP project located above (north of) Knights Landing, the project site must be evaluated for its impacts on occupied and potential bank swallow habitat. A pre-project bank swallow survey will be conducted by a DFG-approved biologist. The survey will include mapping of known and existing bank swallow colonies within a 500-foot radius of the disturbance boundaries of the project. The survey will also include mapping of any suitable breeding colony habitat within the same 500-foot radius. Suitable breeding colony habitat is herein defined by the habitat suitability index model developed to evaluate habitat for bank swallow breeding colonies within the continental United States (Garrison 1989). Based on that model, it is assumed that a bank suitable for a nesting colony must be at least 5 meters (m) (16.7 feet) long; that suitable foraging

habitat occurs within 10 kilometers (km) (6 miles) of the colony; that insect prey are not limited; and that optimal colony locations are in vertical banks, greater than 1 m (3.3 feet) tall, greater than 25 m (83 feet) long, and consisting of suitable soft soils (i.e., sand, loamy sand, sandy loam, loam, and silt loam) in strata greater than 0.25 m (0.8 feet) wide. The pre-project bank swallow survey information will be submitted to DFG in a written report accompanying the project notification materials.

BS-2: Projects at sites containing occupied and/or potential bank swallow habitat within the proposed disturbance boundaries will not be authorized under the SERP. Project sites that contain suitable nesting colony habitat outside the project disturbance limits, but within the 500-foot survey radius, may be authorized under SERP at the discretion of DFG with implementation of additional, site-specific protective measures. However, no project that will affect an existing bank swallow colony will be authorized under the SERP. Any project that would result in take of bank swallow, as defined in California Fish and Game Code section 2081, will require issuance of an incidental take permit from DFG and does not qualify for authorization under the SERP.

NESTING BIRDS/MIGRATORY BIRDS

NB-1: It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the Fish and Game Code. Without prior consultation and approval of a DFG representative, no trees that contain active nests of birds will be disturbed until all eggs have hatched and young birds have fledged. Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, attempt to take capture, or kill, possess any migratory bird, any part, nest, or eggs of any such bird. Because incidental take coverage is not authorized under the MBTA, incidental take of a migratory bird should be avoided. If it is necessary to remove trees for purposes of the project, it is recommended that the trees that are identified for removal be removed during the non-nesting period of August 31 to February 1. If tree removal must occur during the period of February 1 to August 31, a qualified biologist will conduct a preconstruction survey for bird nests or nesting activity within 500 feet of the project boundaries. If any active nests or nesting behaviors are found, DFG and USFWS must be notified prior to further action. DWR may be required to create exclusion zones of between 75 feet and 0.25 mile depending on the species observed. The exclusion zone must be maintained until birds have fledged or the nest is abandoned. The survey results will be provided to DFG prior to removal of any trees.

RAPTORS

R-1: If project work will occur during the raptor nesting season (February 1 to August 31), a focused survey for raptor nests will be conducted by a qualified biologist during the nesting season to identify active nests within 500 feet of the project site. The survey will be conducted no less than 14 days and no more than 30 days prior to the beginning of construction. If nesting raptors are found within 500 feet of the project area, no construction will occur during the active nesting season of February 1 to August 31, or until the young have fledged (as determined by a qualified biologist), unless otherwise approved by DFG.

WOODY SHADED RIVERINE HABITAT

WSRH-1: All remaining, natural woody riparian or shaded riverine aquatic (SRA) habitat will be avoided or preserved to the maximum extent practicable.

WSRH-2: Woody riparian and SRA habitat will be replaced at a 3:1 ratio on an area or linear-foot basis, as determined appropriate by DWR in coordination with NMFS.

WSRH-3: Species chosen for replanting will reflect native species lost during the permitted activity or native species usually found in the riparian and SRA zones of the project location.

WSRH-4: Plantings will be installed during the optimal season for the species being planted. Therefore, completion of the planting effort may not occur at the same time as the remainder of the permitted activity.

WSRH-5: Maintenance of revegetated sites will continue for at least three growing seasons to allow the vegetation to establish. Maintenance will be continued as necessary until the final performance criteria are met.

ANADROMOUS FISH

Conservation measures pertaining to anadromous fish are captured in the above conservation measures.

CULTURAL RESOURCES

CR-1: DWR will ensure that SERP project activities near any historic property do not approach closer to the property than identified and allowed for in the resource-specific historic properties treatment plan (HPTP) and the construction monitoring and inadvertent discovery plan in accordance with requirements of the PA.

CR-2: DWR will ensure that an archaeological monitor is present during any ground-disturbing activities in areas where monitoring of construction is necessary to prevent or reduce adverse effects. Specific situations requiring archaeological monitoring and the methods and procedures for archaeological monitoring will be described in the *Construction Monitoring and Inadvertent Discovery Plan* as stipulated by the PA. In situations other than those described in the *Construction Monitoring and Inadvertent Discovery Plan* which specifically require archaeological monitoring, an archaeologist will be available on an on-call basis. If suspected archaeological materials are discovered during ground-disturbing activities, work will stop at that location and within 50 feet of the find until the archaeologist can inspect and assess the find and provide recommendations to DWR and USACE. Work may not resume at that location until DWR and USACE authorize resumption of work.

J. ANNUAL MONITORING REPORTS

An annual report package that includes the monitoring results from multiple SERP project sites will be submitted to the SERP agencies by November 30 of each year. The report will assess both attainment of yearly performance goals and progress toward final success criteria for each project. The first monitoring report package will be due in November following the first spring monitoring visit (see monitoring schedule in Section H, "Monitoring and Success Criteria"). The monitoring reports will specify the monitoring years (e.g., year 1, year 2) for which the report is being submitted. The information in the reports will be used to assess progress toward meeting the annual performance goals and final success criteria and will include recommended remedial actions to address any performance shortfalls.

The monitoring reports contained in the annual package will include annual monitoring information for each SERP project in accordance with the format outlined below. The projects will be grouped by year to facilitate agency review. A CD containing word versions of the annual report files will be provided as part of the annual report package.

A. Project Information

1. Project name
2. Name, address, and phone number of person(s) preparing the report
3. Acres of project impact and type(s) of habitat impacted
4. Date project construction was completed
5. Date planting was completed
6. Mitigation monitoring year (i.e., first, second, third, etc.)

B. Regional Location Map

C. Site Map (no larger than 11 by 17, unless a different scale is requested by the SERP agencies)

The map should include the following information:

1. Habitat types
2. Locations of designated photo points
3. Landmarks
4. Location of sample points, if applicable

D. Site Information

1. Driving directions to the site
2. Specific purpose/goals for the mitigation efforts at the site
3. Dates and summary of previous maintenance and monitoring visits
4. Summary of previous remedial actions implemented, if any

E. List of Annual Performance Goals and Final Success Criteria

F. Tabulated Results of Monitoring Visits, Including Previous Years, Versus Success Criteria

G. Summary of Recorded Field Data to Determine Compliance with Success Criteria

1. Copy of completed “Qualitative Evaluation Sheet for SERP Project Sites”
2. Color photographs taken from designated photo points during most recent monitoring visit
2. List of plant species originally planted
3. List of plant species observed and relative cover estimates
4. SRA description and relative cover estimates
5. Levee inspection logs (if levee damage was reported during inspection)

H. Conclusions

1. Comparison of monitoring results with the established annual performance goals and final success criteria, including trends toward meeting final success criteria
2. Analysis of quantitative monitoring data
3. Discussion of qualitative monitoring data
4. Suggested changes for monitoring and/or maintenance activities

I. Problems Noted and Proposed Contingency Actions

1. Suggested remedial activities, such as replanting, fencing, irrigating, weeding, revising success criteria, or providing off-site compensatory mitigation.
2. Suggested remedial repairs, if inspection indicates continuing erosion or other damage to levee.

REFERENCES

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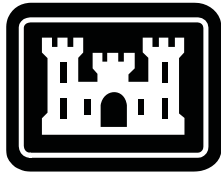
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APPENDIX A

USACE Mitigation and Monitoring Proposal Guidelines



**US Army Corps
of Engineers®**

SPECIAL PUBLIC NOTICE

SAN FRANCISCO and SACRAMENTO DISTRICTS

MITIGATION AND MONITORING PROPOSAL GUIDELINES **December 30, 2004**

INTRODUCTION

The Sacramento and San Francisco Districts of the Corps are jointly publishing these Mitigation and Monitoring Proposal Guidelines to update the existing Habitat Mitigation and Monitoring Guidelines published October 25, 1996 in the Sacramento District and October of 1991 in the San Francisco District. These Guidelines have been updated based upon experience, field investigations, and public input, but retain the main elements presented in the previous Guidelines.

These Guidelines apply throughout the U.S. Army Corps of Engineers' (Corps) San Francisco District, which encompasses the coastal portions of California from northern San Luis Obispo County to the Oregon border; and the Sacramento District, which covers the Central Valley of California, Nevada, Utah and western Colorado (see Figure 1). Both the San Francisco and Sacramento Districts shall herein be referred to as the "Districts." If modifications occur to the Districts' boundaries in the future, these Mitigation and Monitoring Proposal Guidelines will apply to all areas within the revised boundaries.

Overview

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (EPA) regulations (33 CFR Parts 320-331 and 40 CFR Part 230) authorize the Corps to require compensatory mitigation for unavoidable impacts to wetlands and other jurisdictional waters of the U.S. The Corps has commenced several initiatives in response to recommendations contained in the recent National Academy of Science / National Research Council publication "Compensating for Wetland Losses under the Clean Water Act," (2001) and is committed to improving the success of future compensatory mitigation projects.

After the applicant has demonstrated maximum avoidance and minimization of project impacts to waters of the U.S., Corps Districts will likely require compensatory mitigation for the remaining unavoidable impacts. While there may be other options for compensatory mitigation, these guidelines apply to development of plans for onsite and/or offsite establishment (creation), enhancement, and restoration activities, as well as mitigation bank design.

These Mitigation and Monitoring Proposal Guidelines are designed to assist the regulated public and their hired consultants with all aspects of the mitigation process. Approval of a mitigation plan is based on a demonstration that the proposed mitigation can successfully replace all lost functions and values associated with regulated impacts to waters of the U.S.

Changes from the December 31, 2003 Draft Guidelines

This Public Notice finalizes the draft guidance proposed in the Public Notice issued for public comment on December 31, 2003. Based upon comments received during the one-month comment period, we have made significant revisions to the Guidelines format. Most notably, Section I of the original Public Notice included both a section of the comprehensive report entitled “Compensating for Wetland Losses Under the Clean Water Act,” from the National Research Council (NRC), and a list of ten guidelines to aid in planning and implementing successful mitigation projects (“Operational Guidelines for Creating or Restoring Wetlands that are Ecologically Self-Sustaining”; NRC, 2001). Section I, according to many commenters, created unnecessary confusion, contained too many examples of habitat types that are not represented within the boundaries of either District, and was redundant with other portions of the Public Notice. As a result, we did not include the information in this final version (however for reference, this section’s content can be found in Chapter 7 of the National Academy of Science’s report found at http://www.usace.army.mil/inet/functions/cw/hot_topics/nrchottopic.htm). Section II has been simplified and renamed “Section I. Mitigation Planning.” Finally, we moved the annotated proposal outline from Appendix A to the main text of the final guidelines to accurately accentuate its importance in this document and mitigation planning.

Changes from Sacramento District’s 1996 and San Francisco District’s 1991 Guidelines

Sacramento District

There have been a number of changes to the Sacramento District’s 1996 guidelines as a result of the adoption of these guidelines. The Corps policy section and mitigation-banking summary have been replaced, primarily, with a reference list of relevant regulations, guidance, and agreements. The section concerning different submittals for individual and nationwide permits has been removed. Contact information has been updated and enhanced by inclusion of links to the Districts’ websites. *Section I. Mitigation Planning* has been added.

Guidelines for submittal of information on both the project and mitigation sites have been updated. Requests to submit Cowardin designations for types of jurisdictional areas and discuss proposed compensation ratios and long-term goals have been added. The success criteria section has been modified to better allow for site-specific selection of success criteria. Sections on “Maintenance During Monitoring Period” and “Long-term Management” have been added. The request to identify contingency mitigation sites has been removed. Finally, an outline for monitoring reports, and a list of common Cowardin habitat types that occur within the boundaries of the two districts, are included as appendices.

San Francisco District

The primary changes from the previous SF District Proposal Guidelines include requests for Cowardin descriptor codes, slope ratios, groundwater and soil information, aquatic functions, identification of compensation ratios (by applicant), monitoring schedule, and long-term management plans. Expanded information is requested for the monitoring and report sections.

Contact Information for Project Specific Questions:

For answers to questions regarding the interpretation of these Mitigation and Monitoring Proposal Guidelines or acceptable compensatory mitigation for a specific project, contact the Corps Project Manager responsible for your geographic area of interest:

San Francisco District Office general line	415-977-8436
Eureka Field Office general line	707-443-0855
Sacramento District Office general line	916-557-5250
Redding Office	530-223-9534
Reno Office	775-784-5304
Bountiful Office	801-295-8380
Colorado/Gunnison Basin Office	970-243-1199
Durango Office	970-375-9506
Frisco Office	970-668-9676
St. George Office	435-986-3979

References

The documents listed below have been used in creating this guidance and pertain to Corps mitigation policy. They are available for your use on the internet at www.gpoaccess.gov/legislative.html or www.usace.army.mil/inet/functions/cw/cecwo/reg/sadmin3.htm.

1. Clean Water Act Section 404 (33 USC Section 1344)
2. Rivers and Harbors Act of 1899 Section 10 (33 USC Sections 403 et seq.)
3. Environmental Protection Agency, Section 404 (b)(1) Guidelines (40 CFR Part 230)
4. Department of the Army Permit Regulations (33 CFR Parts 320-331)
5. *Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines*, dated 6 Feb 1990
6. *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*, dated 28 Nov 1995
7. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*, dated 7 Nov 2000
8. *Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899*, dated 26 Dec 2002 (RGL 02-02)

Additional Information Available on the Internet

The Corps Regulatory websites also provide important information regarding Corps jurisdiction, processing of permit applications, mitigation design, vernal pools, riparian mitigation guidelines, conservation easements, operation and maintenance plans, dredging, etc.:

San Francisco District's site: www.spn.usace.army.mil/regulatory/

Sacramento District's site: www.spk.usace.army.mil/regulatory.html

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I. MITIGATION PLANNING

Compensatory mitigation projects will proceed through several stages. There are specific issues the applicant must address at each stage in the process, to increase the probability of a successful compensatory mitigation project. The key stages in the development of a compensatory mitigation project are (A) Project Site Impact Assessment, (B) Compensatory Mitigation Site Selection, (C) Compensatory Mitigation Site Design, (D) Compensatory Mitigation Site Construction, (E) Long-Term Compensatory Mitigation Site Maintenance and Monitoring, and (F) Long-Term Site Management. Within each of these areas, the Corps has identified specific concerns that the applicant needs to consider in developing an adequate compensatory mitigation and monitoring plan.

A. Project Site Impact Assessment

An important aspect of any permit application is the assessment of the project site before impacts occur. An adequate assessment of site functions and values is important for determining the relative importance of the existing aquatic resources to the site and to the region or watershed. Assessment results can provide a basis for modifying pre-construction plans to avoid and/or minimize impacts to these resources. This assessment should be completed before the proposed project is designed or the proposed compensatory mitigation site is selected.

B. Compensatory Mitigation Site Selection

1. The selection of a site with suitable hydrologic conditions has been one of the most neglected aspects of compensatory mitigation planning. The National Research Council's *Compensating for Wetland Losses Under the Clean Water Act* (2001) stated that hydrological conditions, including variability in water levels and flow rates, are the primary driving force influencing wetland development, structure, functioning, and persistence. Without a naturally variable source of water (e.g., stream, lake, tidal action), hydrologic processes may not function fully. Lack of a natural

water source has been the number one physical factor leading to the low rate of success of past compensatory mitigation projects. Therefore, mitigation projects that rely on artificial hydrology are generally unacceptable.

2. Site selection should include and prioritize the following criteria:

- a. Natural Hydrology.* The goal should be to have the aquatic feature be supported by a self-sustaining, natural hydrologic process requiring little or no long-term maintenance. It is recommended that the applicant compare hydrologic information at the compensatory mitigation site to similar reference (i.e., high-functioning) sites in the region, as well as to the impact site for design guidance.
- b. Wildlife Corridors.* Where possible compensatory mitigation projects should be developed adjacent to existing high-quality habitats. Even more desirable would be the construction of a compensatory mitigation site that links two or more habitats, which had been previously separated.
- c. Soil Characteristics.* Many past compensatory mitigation projects did not address the development of suitable soils. Examination of soils at reference sites will provide important information on the target habitat. Thorough assessments of mitigation site soils should be conducted to determine the site's suitability for supporting the target habitat. In the case of in-kind compensatory mitigation for wetlands, soils from the impacted aquatic habitat can be used at the compensatory mitigation site.

3. Generally, the physical characteristics of the sites considered determine whether establishment (i.e., creation), restoration, enhancement, or, more rarely, preservation are viable compensatory mitigation options. The categories of compensatory mitigation, as applied to wetlands and as defined in Regulatory Guidance Letter 02-02, are:

- a. Establishment (Creation):* The manipulation of the physical, chemical or biological characteristics present to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Establishment results in a gain in wetland acres.
- b. Restoration:* The manipulation of the physical, chemical or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:
 - i. Re-establishment:* The manipulation of the physical, chemical or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres.
 - ii. Rehabilitation:* The manipulation of the physical, chemical or biological characteristics of a site with the goal of repairing natural or historic functions of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres.
- c. Enhancement:* The manipulation of the physical, chemical or biological characteristics of a wetland (undisturbed or degraded) site to heighten, intensify or improve specific function(s) or to change the growth stage or composition of the

vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. This term includes activities commonly associated with enhancement, management, manipulation and direct alteration.

d. Protection/Maintenance (Preservation): The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This term includes the purchase of land or easements, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term preservation. Preservation does not result in a gain of wetland acres and will be used as mitigation only in exceptional circumstances.

C. Compensatory Mitigation Site Design

1. Use a reference site to guide the design of mitigation. A reference site is a functioning aquatic system containing habitat that functions equal to or preferably better than the impact site and should be used to guide both the mitigation design and the success criteria of the final compensatory mitigation plan. The reference site may be the impact site or a similar site near the proposed mitigation site that supports the target habitat.

2. There are several important features to any successful compensatory mitigation design or plan. Each aspect of the plan must be identified in detail and explained clearly. Although there may be variation in the number of items required for a particular plan, those identified below should be assumed to be the minimum. The Corps strongly recommends that contents of written submittals follow the format provided in “Section II. Mitigation and Monitoring Proposals.”

- a. *Clearly Define the Purpose of the Compensatory Mitigation Project.* The purpose of the compensatory mitigation project shall be clearly identified and include specific statements about the type(s) of habitat (and associated functions and values) impacted by constructing the proposed project, the functions and values that would be replaced at the proposed compensatory mitigation site, and any other functions and/or values that are desired (e.g., endangered species habitat, water quality functions, etc.).
- b. *Develop a Comprehensive Hydrology Component.* For wetlands, information should be developed on depth, duration, and timing of ponding/saturation (inland areas); porosity of underlying soils; tidal ranges and frequencies (estuarine and marine areas); groundwater levels and fluctuations; mitigation site topography; and whether urban stormwater runoff is a water source. Provide information about the amount and the variability of water available to the site in an average rain year (October 1 – September 30). For channels, information should be developed on longitudinal profiles, frequency and depth of flooding (usually for 2-year, 5-year, 10-year, and 100-year storms), bank-full (channel-forming) flows under current and projected conditions, relevant cross-sections, substrate in the project/reference reach, channel history, upstream watershed conditions, and water-rights availability (if applicable).
- c. *Develop a Complete Grading Plan Making Use of the Hydrology Data.* Elevations are critical to design success; grading plans should depict no coarser than one-foot contours. Topographic variation should often be incorporated into the design to maximize aquatic habitat diversity. Examine adjacent or nearby viable habitats as a

reference.

- d. *Determine the Adequacy of the Soils to Support the Target Habitat Types.* It is important to consider whether the soils will support the target aquatic habitat. Additionally, consider whether site preparation activities will significantly alter the site's ability to support the target aquatic habitat type. Finally, determine whether soil amendments will be necessary for long-term habitat development (e.g., organic matter, nitrogen, etc.).
- e. *Develop a Draft Plant Palette Based on the Compensatory Mitigation Project Purpose, Soil Types, and Hydrology.* Identify tree, shrub, and herbaceous species to be planted, the source of the material, and the number and size of individual plants. Plant stock should be obtained from areas as near to the compensatory mitigation site as possible, to preserve the genetic integrity of the area.
- f. *Propose Realistic Success Criteria Based on the Purpose of the Compensatory Mitigation, Design of the Site, and Functional Assessment Criteria.* Develop measurable success criteria, consistent with the purpose and goals of the compensatory mitigation project, that are achievable by the end of the maintenance and monitoring period (generally five years to ten years). Success criteria in compensatory mitigation projects have included percent canopy cover, percent plant survival, plant vigor, percent of native species, period of inundation, stability of designed hydrologic features, wildlife usage and plant heights.
- g. *Develop a Specific Maintenance and Monitoring Program Including Contingency Measures.* Cover all subjects in the Guidelines that are appropriate to your project. The discussion of potential contingency measures should be brief, but acknowledge that should all or a portion of the required mitigation fail, additional measures may be necessary to fulfill the permittee's mitigation responsibility. If all feasible mitigation areas at the original mitigation location have already been used, a new off site location may be necessary to complete the mitigation.

3. In general, the Corps prefers that the compensatory mitigation site be constructed prior to or concurrently with the project construction. If compensatory mitigation will not be constructed until after project impacts, the Corps will likely increase the replacement ratio, to minimize temporal losses of functions and values associated with project impacts.

D. Compensatory Mitigation Site Construction

The permittee will not begin construction until the Corps approves the final compensatory mitigation and monitoring plan. The mitigation implementation process will normally require on-site management of construction personnel by one or more of the permittee's representatives, who have complete knowledge of the compensatory mitigation and monitoring plan and an understanding of soil science, hydrology, and botany, horticulture, or plant ecology. Sensitive areas should be staked, flagged or fenced to preclude unauthorized construction impacts. The permittee is responsible for the successful implementation of the compensatory mitigation. Any significant deviations identified during construction must be approved by the Corps. Additionally, consideration should be given to exotic species control during site preparation to minimize future maintenance and ensure successful mitigation. Personnel should consider removal of exotic species prior to grading and take invasive plant material from the site; in some circumstances, it may be necessary to remove the exotic seed banks by scraping and disposing the top few inches of soil.

E. Long-Term Compensatory Mitigation Site Maintenance and Monitoring

1. Develop specifics regarding the type and timing of maintenance and monitoring. Detail how often and when it will occur.
2. After the site has been graded and planted, the maintenance and monitoring phase of the compensatory mitigation project begins immediately. There are many invasive problematic plant species that will readily colonize a recently disturbed site. A proactive program to remove these plants upon discovery is usually advisable to allow establishment of desirable vegetation. As the target vegetation becomes established, the need for invasive plant species removal will likely lessen.
3. An important aspect of the maintenance and monitoring phase of nearly all compensatory mitigation projects is ensuring the appropriate depth, duration, and timing of onsite water. It is recommended that the permittee compare hydrologic information at the compensatory mitigation site to reference (i.e., high-functioning) sites in the region.
4. Contingency measures should be considered in mitigation site design. If approved success criteria are not met, the permittee must prepare an analysis of the likely cause(s) of failure(s) and propose remedial actions for Corps approval. Consider what sources of funding will be available to ensure the required compensatory mitigation occurs successfully. Contingency measures could include selection of an alternative location.
5. Monitoring reports are required for all mitigation sites. Propose annual dates that monitoring reports will be provided to the Corps. Appendix C provides an outline of what content should be provided in the specific pages of the monitoring report. The Corps recognizes there may be cases where this outline would not be practical (for very small, large, or complex compensatory mitigation projects). Failure to submit complete and timely monitoring reports could result in suspension of the permit or requirements for additional compensatory mitigation. Non-compliance with Corps permit conditions, which can result in additional compensatory mitigation requirements, may be subject to the Corps' Enforcement Procedures (33 CFR Part 326).

F. Long-Term Site Management

1. Protection of mitigation sites is usually required "in perpetuity" in keeping with the mitigation goals. The mitigation and monitoring plan must include the identification of a long-term manager/owner (usually a non-profit or a governmental agency), and should include a conservation easement or other documentation of long-term protection and a well-designed long-term management plan.
2. The permittee is usually required to provide a realistic endowment or other financial assurance to cover long-term maintenance activities.

SECTION II. RECOMMENDED PROPOSAL CONTENTS

A. Table of Contents

B. Responsible Parties: Provide names, titles, addresses, and phone numbers of responsible parties including contact persons.

1. *Applicant/Permittee:* The project proponent, not consultant, should be listed.
2. *Applicant's Designated Agent* (if any)
3. *Preparer(s) of the Proposal/Plan*

C. Project Requiring Mitigation

1. **Location:** Describe location and provide: a) road map with site location clearly shown, and b) USGS quad map with project site and watershed outlined (clear photocopies are acceptable).
2. **Brief Summary of Overall Project:** In a few paragraphs, describe the overall project for which a permit or authorization is required. Include type of development (or other work), project size, and a brief projected schedule of project construction.
3. **Site Characteristics:**
 - a. *Jurisdictional Areas* – Identify those jurisdictional areas as shown on the approved delineation to be directly or indirectly affected by the project. Provide an appropriately sized topo base map with jurisdictional areas and impacts clearly shown (may be same map as under “1.” above). Indicate on the map whether the jurisdictional areas are wetlands and/or other waters. Also provide a table indicating acreage of wetland impacts by habitat common name with Cowardin designation, and linear feet and width of impacts to streams and/or tributaries.
 - b. *Aquatic Functions* - Describe functions of aquatic features that will be lost and/or directly or indirectly impacted. This may include, but is not limited to, water filtration, sediment storage, flood retention, wildlife habitat, endangered species habitat, etc. (For further information, see <http://www.epa.gov/watertrain/wetlands/>).
 - c. *Hydrology/Topography* – Describe hydrology and topography, including slope ratios of wetland features and stream banks, and identify the water's source, frequency, duration and depth of inundation for the site. Indicate groundwater level(s), if known, and significant pollutants.
 - d. *Soils/Substrate* – Describe texture, organic matter content, permeability, and presence of restrictive layers in aquatic features.
 - e. *Vegetation* – The dominant plant communities, as well as special status plant species, of each stratum in the vegetated plot should be identified. Provide a map of the dominant plant communities.

- f. *Threatened/Endangered Species* – Identify any federally-listed (including proposed) species found on or near the site for which suitable habitat is present, including whether the site is within designated critical habitat.

D. Mitigation Design

1. Location – Describe location and provide: a) road map with site location clearly shown, and b) USGS quad map with project site outlined. Clear photocopies are acceptable.

2. Basis for Design: Provide a concise summary of the rationale for choosing the proposed type(s) and location(s) of mitigation.

3. Characteristics of Design Reference Site (if different from impact site):

- a. *Jurisdictional Areas* - Provide a jurisdictional determination of the reference site(s) with identified sample plots that are large enough to capture the desired aquatic design characteristics.
- b. *Aquatic Functions* – Describe functions of the reference aquatic site. This may include but is not limited to, water filtration, sediment storage, flood retention, wildlife habitat, endangered species habitat, etc.
- c. *Hydrology/Topography* – Describe hydrology and topography, including slope ratios of wetland features and stream banks, and identify the water’s source, frequency, duration and depth of inundation for the site. Indicate groundwater level(s) if known and significant pollutants.
- d. *Soils/Substrate* – Describe texture, organic matter content, permeability, and presence of restrictive layers in aquatic features.
- e. *Vegetation* – The dominant plant communities, as well as special status plant species, of each stratum in the vegetated plot should be identified.

4. Proposed Mitigation Site

- a. *Location* – Describe location, indicating distance from project site, if applicable. Provide the following maps: a) site location on a road map, and b) original or copy of USGS quad map with mitigation location outlined.
- b. *Ownership Status* – Indicate who owns the proposed mitigation site. If different from permit applicant(s), describe the property’s availability and easement history.
- c. *Jurisdictional Areas* (if any) – Provide a proposed jurisdictional map of the site. Indicate what portions of the jurisdictional areas, if any, are to be filled and/or altered under the mitigation proposal.
- d. *Aquatic Functions* (if any) – Describe expected functions and values of any existing aquatic features on the mitigation site. This may include, but is not limited to, water filtration, sediment storage, flood retention, wildlife habitat, endangered species habitat, etc.

- e. *Hydrology/Topography* – Describe the current hydrology and topography of the site, including intended water source for mitigation features.
- f. *Soils/Substrate* – Describe overall site series and existing channel substrate (if applicable).
- g. *Vegetation* – Describe and provide a map of the existing dominant plant communities, as well as any special status plant species. Also provide a table indicating approximate acreage of the habitats.
- h. *Present and Historical Uses of Mitigation Area* - Briefly describe all known present and historical uses of mitigation area. On a plan view, indicate any pipelines, power lines, roads, encroachments, or easements. Also show distance and location of nearest structures, if any, on the mitigation property or on any properties adjoining the mitigation project. Give all present and proposed zoning designations for mitigation site, including city and county.
- g. *Present and Proposed Uses of All Adjacent Areas* - Briefly describe all known present and proposed uses and zoning designations of all property sharing a common border with the proposed mitigation site.

5. Created/Restored Habitat(s)

- a. *Compensation Ratios* – Provide a table indicating the ratio(s) of impact wetland acreage and/or linear feet of channel to compensation acreage and/or linear feet of channel, both overall and by aquatic feature type.
- b. *Long-Term Goal(s)* – Describe the target habitat to be created/restored. Most mitigation designs are aimed at a habitat with certain characteristics that will not exist at the site until long after the monitoring period has ended. Please describe the projected state of the mitigation area in 10 to 30 years following implementation.
- c. *Aquatic Functions* – Describe expected functions of the compensatory aquatic features.
- d. *Hydrology/Topography* – Provide a hydrologic budget that identifies source, duration, volume and direction of water flow for the proposed mitigation feature(s) during the average climatic year. Provide information on the feature's hydrologic connectivity to downstream tributaries and navigable waters, as applicable. If the mitigation site is targeting a saturated, flooded or ponded wetland, an estimation of the average period of saturation, ponding or flooding should be included, as well as a wetland watershed map.

Include a grading plan indicating intended slope ratios of wetlands and/or stream banks and overall area of disturbance.

- e. *Soils/Substrate* – Describe suitability of soils/substrate at intended compensation locations for creation/restoration of aquatic features.
- f. *Vegetation* – Describe target plant communities and species. Provide a proposed planting plan.

E. Success Criteria and Monitoring

1. Success Criteria – Provide a table of success criteria. Quantifiable success criteria are used to determine completion of a permittee’s mitigation responsibilities and are proposed by the applicant for Corps approval. Meeting these criteria will indicate that the mitigation area is progressing well towards replacement of lost functions and achievement of the long-term mitigation goals. The criteria should address each major aspect of the project, including hydrological success, establishment of appropriate vegetation, and habitat establishment.

2. Monitoring

- a. Methods* – Explain why each method has been chosen to evaluate progress in relation to each success criterion. The appropriateness of a method will depend on the objective it is addressing and the characteristics of the feature being surveyed. Describe sampling methods used. Include size of sample unit, number of samples. If using transects for assessment of vegetation, provide a map of the mitigation area(s) showing intended transect lines.
- b. Monitoring Schedule* – Monitoring should be tied to the appropriate growing, tidal or hydrology cycle rather than the point at which implementation happens to occur. Monitoring will generally not be considered to be “first year” monitoring until one full growing season (for vegetation) or target activity period (for hydrology/geomorphology) has passed following completion of installation. Also, although in many situations it is crucial to monitor all project components during the first five years or so, this is not necessarily true for every project. In some cases, it is not appropriate to begin quantitatively monitoring one or another component until a few years after implementation. In other cases it may be necessary to do annual monitoring for the first four to six years, and then monitor every other year for the remainder of the monitoring period. (However, in years where formal monitoring reports are not required, on-site inspections and documentation of site conditions should still occur.)
- c. Photo-Documentation* – In addition to quantitative methods, ground and/or aerial photos can be used to illustrate year-to-year progress of the overall project. Ground photos should generally be panoramic, and taken from a high point relative to the mitigation site such that photos taken in later years will not be obscured by developing vegetation. All such photos should be taken from the exact same point every year to allow for inter-annual comparison. If aerial photos are being used for measurements, they should be directly vertical and have identifiable ground-references to provide a reasonably accurate scale. Copies of color photos should be done in color.

F. Implementation Plan

1. Site Preparation

- a. Grading Implementation* – Describe equipment, procedures, access paths, etc., if they affect aquatic resources.
- b. Avoidance Measures* – Describe any measures used to avoid sensitive areas outside of the grading plan.

- c. *Soil Disposal* – Indicate storage location, if any, and ultimate destination of any excavated materials.
- d. *Soil Treatment* – Indicate any soil modification(s) planned for the mitigation site, including spreading of inoculum. Also indicate source, storage location, storage duration, and intended placement of any soil to be used.
- e. *Pest Plant Removal* – Describe method(s) to be used to remove any pest plants from the mitigation site.
- f. *Construction Monitor* – Provide a statement that a person/firm familiar with the mitigation/monitoring plan will supervise all site phases of mitigation construction. This person should have authority to direct equipment operators, and should submit a summary report to the Corps documenting construction observations and any problems that arose during construction.

2. *Planting/Seeding*

- a. *Planting Plan* – Provide a table of species to be planted and indicate geographic source of plants (should be as local as possible), type of propagules to be used, and season in which seeding/planting/transplanting is to be done. Include size and quantity of propagules and/or intended spacing.
 - b. *Nature and Source of Propagules* – Indicate types, sizes, and sources of propagules. Seeds, seedlings, canes, young plants and transplants should be from as local a stock as possible. For transplant propagules, describe method, location of harvest site, and duration of storage, if applicable
3. ***Irrigation*** - Most mitigation projects should become hydrologically self-sustaining. The function of irrigation in the early years of a project is to give new vegetation a head start at becoming established. Describe any proposed irrigation methods, including estimated frequency, and indicate month(s) in which it is to occur. Also indicate water source(s) for irrigation. In arid climates, mitigation planning should include contingency irrigation in case of drought. In most cases, irrigation is usually confined to the first 2-3 years after plant installation and success criteria are not considered met until at least two years have passed since irrigation ceased.
4. ***Implementation Schedule*** - Provide a schedule showing intended timing (by month) of site preparation, any seed/topsoil storage, seed/topsoil application, and plantings.

G. Maintenance during Monitoring Period

1. *Maintenance Activities*

- a. *Overall* – Describe planned maintenance activities (e.g. inspection of irrigation system, inspection of water structure(s), erosion control, weeding, etc.). Note that irrigation-system failure is a common source of difficulties in the early years of a project. Many of these problems can be avoided by relatively frequent inspections of the system during the dry season in the first couple of years.

- b. *Pest Species Control* - Identify any pest species (plant and/or animal) that might cause problems on the site, and provide a control plan for these species if appropriate. Indicate the critical threshold of disturbance that will trigger the implementation of control methods.
2. *Maintenance Schedule* – Provide a table showing proposed schedule of frequency of maintenance inspections over the life of the project.

H. Proposed Monitoring Reports

1. *Due Dates* - The applicant must identify an annual due date for reports (i.e., month and day).
2. *As-Builts* – A topographic survey of the as-built mitigation area should be submitted to the Corps within 6 weeks of completion of mitigation construction. The Corps will decide the appropriate scale of topographic survey on a case-by-case basis.
3. *Annual Reports*
 - a. *File Number* – Include the Corps permit/file number on the cover and title page of all reports and correspondence.
 - b. *Contents* – The required contents for annual reports is listed below:
 - i. Years of full monitoring – Appendix C describes the content of annual monitoring reports.
 - ii. Years of partial monitoring, where required - Occasionally, due to project-specific factors, it is appropriate to perform a reduced monitoring program for one or more monitoring years. The nature and extent of this monitoring would be described in permit documents, and the reporting is usually in the form of a letter.
 - iii. Final monitoring report – In the final monitoring report, include a delineation of any constructed wetlands, in addition to the normal content of a monitoring report.

I. Potential Contingency Measures

1. *Initiating Procedures* – If an annual performance goal is not met for all or any portion of the mitigation project in any year, or if the final success criteria are not met, the permittee should prepare an analysis of the cause(s) of failure and propose remedial action for Corps approval. Remedial actions could range from replanting, to relocating the mitigation site.
2. *Contingency Funding Mechanism* - Indicate what funds will be available to pay for planning, implementation, and monitoring of any contingency procedures that may be required and present all necessary assurances that the funds will remain available until success criteria have been achieved.

J. Completion of Mitigation Responsibilities

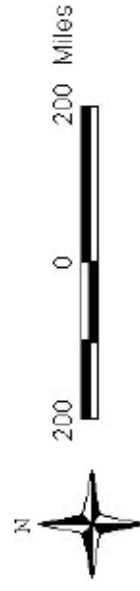
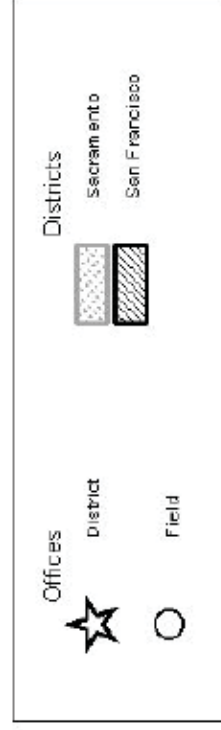
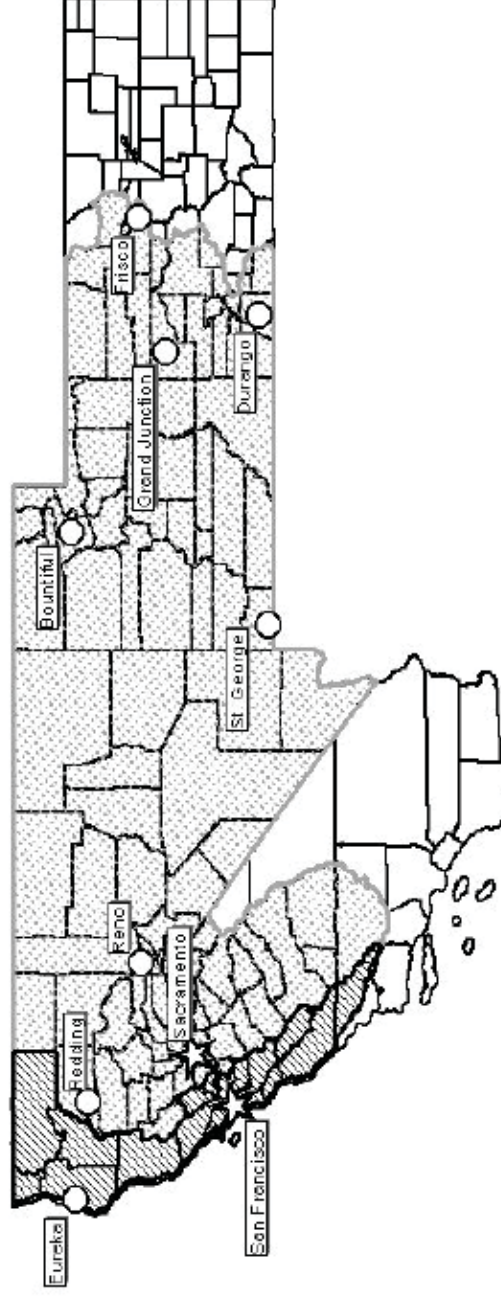
- 1. Notification** – When the required monitoring period is complete and the permittee believes that the final success criteria have been met, the permittee shall notify the Corps when submitting the proposed final report. For mitigation plantings, final success criteria will not be considered met until a minimum of two years after all maintenance (e.g. irrigation, replanting, rodent control, fertilization) has ceased.
- 2. Corps Confirmation** - Following receipt of the proposed final report, the Corps will either confirm the successful completion of the mitigation obligation or require additional years of monitoring. The permittee is not released from any mitigation obligation until written notice of completion is received from the Corps.

K. Long-Term Management

- 1. Property Ownership** - Identify the owner of the mitigation site following completion of mitigation monitoring period.
- 2. Management Plan**
 - a. Resource Manager.** Identify the entity that will provide the resource management for the site following mitigation sign-off.
 - b. Management Approach.** The long term management plan should describe any proposed grazing, fencing, fire-management activities, provisions for public access, invasive exotic plant control program (if applicable), annual reporting, and any other proposed activities.
- 3. Site Protection** - Long-term site-protection mechanism (e.g., ownership by conservation organization, conservation easement, etc.) should be included. Indicate responsible parties and funding mechanism. A Property Analysis Record (PAR) analysis or similar method should also be used to determine how much money will be needed to manage the property over the long term. The long-term manager should be in agreement with the amount provided.

Sacramento & San Francisco **District Boundaries & Offices**

September 15, 2004



APPENDIX A1. RECOMMENDED PROPOSAL CONTENTS

A. Table of Contents

B. Responsible Parties

- 1. Applicant/Permittee*
- 2. Applicant's Designated Agent*
- 3. Preparer(s) of the Proposal/Plan*

C. Project Requiring Mitigation

- 1. Location*
- 2. Brief Summary of Overall Project*
- 3. Site Characteristics:*
 - a. Jurisdictional Areas*
 - b. Aquatic Functions*
 - c. Habitat Types*
 - d. Hydrology/Topography*
 - e. Soils/Substrate*
 - f. Vegetation*
 - g. Threatened/Endangered Species*

D. Mitigation Design

- 1. Location*
- 2. Basis for Design*
- 3. Characteristics of Design Reference Site (if different from impact site):*
 - a. Jurisdictional Areas*
 - b. Aquatic Functions*
 - c. Hydrology/Topography*
 - d. Soils/Substrate*
 - e. Vegetation*
- 4. Proposed Mitigation Site*
 - a. Location*
 - b. Ownership Status*
 - c. Jurisdictional Areas (if any)*
 - d. Aquatic Functions (if any)*
 - e. Hydrology/Topography*
 - f. Soils/Substrate*
 - g. Vegetation*
 - h. Present and Historical Uses of Mitigation Area*
 - i. Present and Proposed Uses of All Adjacent Areas*

5. Created/Restored Habitat(s)

- a. Compensation Ratios*
- b. Long-Term Goal(s)*
- c. Aquatic Functions*
- d. Hydrology/Topography*
- e. Soils/Substrate*
- f. Vegetation*

E. Success Criteria and Monitoring

1. Success Criteria

2. Monitoring

- a. Methods*
- b. Monitoring Schedule*
- c. Photo-Documentation*

F. Implementation Plan

1. Site Preparation

- a. Grading Implementation*
- b. Avoidance Measures*
- c. Soil Disposal*
- d. Soil Treatment*
- e. Pest Plant Removal*
- f. Construction Monitor*

2. Planting/Seeding

- a. Planting Plan*
- b. Nature and Source of Propagules*

3. Irrigation

4. Implementation Schedule

G. Maintenance during Monitoring Period

1. Maintenance Activities

- a. Overall*
- b. Pest Species Control*

2. Maintenance Schedule

H. Proposed Monitoring Reports

- 1. *Due Dates***
- 2. *As-Builts***
- 3. *Annual Reports***
 - a. File Number*
 - b. Contents*
 - i. Years of full monitoring
 - ii. Years of partial monitoring, where required
 - iii. Final monitoring report

I. Potential Contingency Measures

- 1. *Initiating Procedures***
- 2. *Contingency Funding Mechanism***

J. Completion of Mitigation Responsibilities

- 1. *Notification***
- 2. *Corps Confirmation***

K. Long-Term Management Plan

- 1. *Property Ownership***
- 2. *Management Plan***
 - a. Resource Manager.*
 - b. Management Approach.*
- 3. *Site Protection***

APPENDIX A2. SUMMARY LIST OF MAPS, TABLES, AND SCHEDULES FOR SUBMISSION

WITH PROPOSALS (This is a minimum list. It is only necessary to submit the items that apply to your project. Add additional items as needed.)

A. Maps

1. Project Requiring Mitigation

- a. Road Map
- b. USGS Map
- c. Approved Jurisdictional Map
- d. Habitat Map

2. Mitigation Design – Reference Site

- a. Road Map
- b. USGS Map
- c. Proposed Jurisdictional Map for Reference Site

3. Mitigation Design – Mitigation Site

- a. Road Map
- b. USGS Map
- c. Proposed Jurisdictional Map
- d. Vegetation/Habitat Map
- e. Plan View Showing Distance to and Location of Nearest Structures

4. Mitigation Design - Created/Restored Habitat

- a. Wetland Watershed Map
- b. Grading Plan
- c. Planting Plan

B. Tables

- 1. Impact Acreage*
- 2. Impact vs. Mitigation Acreage/Linear Feet*
- 3. Success Criteria*
- 4. Species to Be Planted*

C. Schedules

- 1. Monitoring*
- 2. Implementation*
- 3. Maintenance Inspections*

APPENDIX B. FORMAT INFORMATION

A. Reports/Proposals

1. Headings

All cover, title page, or letter headings must contain the Corps File Number and the date of the document.

2. Contributor Page

List all persons who prepared plan, did monitoring, and/or wrote or edited the text.

3. Distribution Page

List names, titles, and companies/agencies of all persons receiving a copy of the report.

4. Binding

All reports and proposals should be single, stand-alone, separately bound documents. Except for full-size drawings, all materials submitted should be, or be folded to, 8 ½" x 11". Do not submit reports in three-ring binders as they do not work with our filing system. Please bind your final submittal with this in mind.

B. Figure Format

All maps and plans submitted should be legible, complete, clear, and at the appropriate scale. Each should include the following:

1. Title Block.

2. Date of Preparation.

3. Date(s) of any Modifications.

4. 1" Margin at Top of Sheet.

5. North Arrow (Plan Views).

The orientation of the map on the page (as it is read) should be the same for all maps submitted. By convention, North will normally be toward the top of the page.

6. Scale.

Base topo maps should be full-sized (1 inch = 100 feet or less, 1 inch = 200 feet for very large projects).

7. Datum.

Reference elevation datum must be indicated on both plan and section views.

8. Jurisdictional Boundaries

Tidal waters – MLLW, MHW, HTL

Non-tidal waters (stream channels) – OHW

Wetlands – boundaries

9. Legend

Identify all symbols, patterns or screens used. If color figures are used, information should be understandably presented in a form that is reproducible in black and white.

APPENDIX C. MONITORING REPORT OUTLINE

I. Monitoring Report Content

A. Project Information

1. Project name
2. Applicant name, address, and phone number
3. Consultant name, address, and phone number (if appropriate)
4. Corps permit file number
5. Acres of impact and type(s) of habitat impacted
6. Date project construction commenced
7. Indication of mitigation monitoring year (i.e. first, second, third, etc.)
8. Amount and information on any required performance bond or surety, if any

B. Compensatory Mitigation Site Information

1. Location of the site (regional map may be appropriate)
2. Specific purpose/goals for the compensatory mitigation site
3. Date mitigation site construction and planting completed
4. Dates summary of previous maintenance and monitoring visits
5. Name, address, and contact number of responsible parties for the site
6. Summary of remedial action, if any

C. Location Map

D. Site Map (usually no larger than 11 x 17 unless a different scale is requested by the project manager).

The map should include the following information:

1. Habitat types as described in the approved mitigation plan
2. Locations of any photographic record stations
3. Landmarks
4. Location of sample points

E. List of Corps-Approved Success Criteria

F. Tabulated Results of Monitoring Visits, Including Previous Years, Versus Success Criteria

G. Summary of Field Data Taken to Determine Compliance with Success Criteria

H. Problems Noted and Proposed Remedial Measures

II. Appendices

A. Original Data Sheets and Technical Appendices, as required by the Corps project manager

B. Photographic Record of the Site during most recent monitoring visit at record stations

Classification of Wetlands and Deepwater Habitats of the United States
Cowardin ET AL. 1979 as modified for National Wetland Inventory Mapping Convention



WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

SYSTEM		L - LACUSTRINE												
SUBSYSTEM		1 - LIMNETIC					2 - LITTORAL							
CLASS	Subclass	RB - ROCK BOTTOM	UB - UNCONSOLIDATED BOTTOM	AB - AQUATIC BED	OW - OPEN WATER/ Unknown Bottom	RB - ROCK BOTTOM	UB - UNCONSOLIDATED BOTTOM	AB - AQUATIC BED	RS - ROCKY SHORE	US - UNCONSOLIDATED SHORE	EM - EMERGENT	OW - OPEN WATER/ Unknown Bottom		
		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent			
SYSTEM		P - PALUSTRINE												
CLASS	Subclass	RB - ROCK BOTTOM	UB - UNCONSOLIDATED BOTTOM	AB - AQUATIC BED	US - UNCONSOLIDATED SHORE	ML - MOSS-LICHEN	EM - EMERGENT	SS - SCRUB-SHRUB	FO - FORESTED	OW - OPEN WATER/ Unknown Bottom				
		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Deciduous 3 Broad-Leaved Evergreen 4 Deciduous 5 Broad-Leaved Evergreen 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen					
MODIFIERS														
In order to more adequately describe the wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.														
WATER REGIME						WATER CHEMISTRY			SOIL					
Non-Tidal						Coastal Salinity		Inland Salinity		pH Modifiers for all Fresh Water				
A Temporally Flooded	H Permanently Flooded	K Artificially Flooded	L Subtidal	M Irregularly Exposed	N Regularly Exposed	1 Hyperhaline	2 Euthaline	7 Hypersaline	8 Eusaline	9 Mixosaline	0 Fresh	g Organic n Mineral	b Beaver d Partially Drained/Ditched f Farmed	h Diked/Impounded r Artificial Substrate s Spoil x Excavated
B Saturated	I Intermittently Flooded					3 Mixohaline (Brackish)	4 Polyhaline	5 Mesohaline	6 Oligohaline	0 Fresh				
C Seasonally Flooded/Well Drained	W Intermittently Flooded/Temporary													
D Seasonally Flooded/Saturated	Y Saturated/Semipermanent/Seasonal													
E Seasonally Flooded/Saturated	Z Intermittently Exposed/Permanent													
F Semipermanently Flooded	U Unknown													
G Intermittently Exposed														
* These water regimes are only used in tidally influenced, freshwater systems.														

NOTE: Italicized terms were added for mapping by the National Wetlands Inventory program.

APPENDIX B

CEQA Compliance Checklist

CEQA COMPLIANCE CHECKLIST FOR PROPOSED SERP PROJECTS

1. INTRODUCTION

As described in Section D, “Regulatory Mechanisms,” of the Small Erosion Repair Program (SERP) Manual, the California Department of Water Resources (DWR) has determined that a program environmental impact report (PEIR) is the appropriate environmental document to meet California Environmental Quality Act (CEQA) requirements for the SERP. To focus the scope of the PEIR, DWR circulated an initial study (IS) with the Notice of Preparation (NOP), which is included in the PEIR as Appendix A.

CEQA encourages the use of a written checklist or similar tool when determining if site-specific operations are covered in program-level documents (State CEQA Guidelines, Section 15168[c][4]). This CEQA Compliance Checklist will be used to inform DWR whether the existing SERP PEIR provides adequate CEQA coverage for proposed SERP projects or if further project-level environmental documentation will be required to fully satisfy CEQA requirements.

2. APPLICATION OF THE PROGRAM-LEVEL ANALYSIS UNDER CEQA

State CEQA Guidelines, Section 15168(c) discusses how subsequent activities in a program must be examined in light of the PEIR to determine whether additional environmental documents must be prepared under CEQA. With a good and detailed analysis of the program, many subsequent activities may be found to be within the scope of the project described in the PEIR, and no further environmental documents would be required. The SERP has been developed with this understanding, and the SERP Manual includes specific parameters that subsequent projects must meet to be considered eligible for inclusion in the SERP; only proposed small erosion repair projects that meet the SERP Manual requirements will be considered part of the SERP. Consequently, subsequent project activities included in the SERP are similar, and the analyses in the SERP PEIR are effective in evaluating all potential impact mechanisms and establishing effective conservation measures and mitigation for the narrow range of projects covered under the SERP.

Combining key statements from the State CEQA Guidelines in Sections 15168(c) and 15162(a) results in the following list of questions that determine whether the existing SERP PEIR provides complete CEQA coverage for proposed projects and no further CEQA action is required:

1. Is the proposed project outside the scope of the project covered by the PEIR?
(If a proposed project is determined to be outside the scope of the SERP, using

the criteria contained in the SERP Manual, then the proposed project may not be fully analyzed per CEQA requirements in the SERP PEIR.)

2. Does the proposed project have effects that were not examined in the SERP PEIR?
3. Are there any new significant environmental effects from the proposed project that were not discussed in the SERP PEIR, including cumulative impacts?
4. Can the proposed project cause a substantial increase in the severity of previously identified significant effects in the SERP PEIR, including cumulative impacts?
5. Are there mitigation measures or alternatives that are considerably different from those analyzed in the SERP PEIR that would substantially reduce one or more significant effects on the environment, but DWR declines to adopt the mitigation measure or alternative?
6. If the responses to questions 1–5 are all “no,” then no further environmental analysis is required, and the SERP PEIR is sufficient to meet all CEQA requirements for the proposed project.

3. RELATIONSHIP TO THE SERP NOTIFICATION PACKAGE

DWR will provide SERP project notification to the SERP agencies through submittal of an annual SERP project notification package. The package, to be submitted each year by July 1, will provide site-specific information for small erosion repair sites proposed for SERP authorization during the construction period (September through October) of the same year. The SERP project notification package will contain the following information for each proposed project:

1. Completed SERP Notification Form
2. Completed Baseline Assessment Checklist
3. Photographs of project site with project foot-print/action area (defined as all APE—access, staging, construction)
4. Project diagrams (i.e., project vicinity map, site plan, cross section)
5. Delineation of special aquatic sites and other waters of the United States and/or the state. Wetland delineations must be prepared in accordance with the current methods and standards required by USACE.
6. Map of adjacent repair locations
7. CDFW and the RWQCB only: notification fees

8. A single (for each notification package) completed ENG Form 4345 Application for a Department of the Army Permit

The CEQA Compliance Checklist will be completed after waters of the United States and/or the State have been delineated on the site so that an adequate evaluation of potential impacts on waters of the United States and/or the State can be made.

4. CEQA COMPLIANCE CHECKLIST

This three-step CEQA Compliance Checklist will be used to determine whether an erosion site is eligible for implementation under the SERP. If existing program-level analyses in the SERP PEIR provide adequate environmental analyses, no additional CEQA documentation will be required. Impact mechanisms that were found to have no impact in the SERP PEIR were not assessed further.

CEQA Compliance Checklist for Proposed SERP Projects

Step 1. Evaluate Documentation Necessary to Complete CEQA Compliance Checklist

Are the following application materials compiled:

- ☐ SERP Project Notification Form
- ☐ Baseline Assessment Checklist
- ☐ Photographs of the project site with project foot-print/action area (defined as all APE—access, staging, construction)
- ☐ Project diagrams (i.e., project vicinity map, site plan, cross section)
- ☐ Delineation of special aquatic sites and other waters of the United States and/or the state.
- ☐ Map of adjacent repair locations

Step 2. Complete Initial Checklist of Potential Environmental Impacts		
PEIR Impacts Identified as “Less Than Significant”		
SERP PEIR Section or Appendix	Impact	Would the proposed project cause any less-than- significant impact disclosed in the SERP PEIR to be potentially significant or significant?
Aesthetics		
Appendix A	I-a: Cause a substantial adverse effect on a scenic vista	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	I-b: Cause substantial damage on scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	1-c: Substantially degrade the existing visual character or quality of the site and its surroundings	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	1-d: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Agriculture and Forestry Resources		
Appendix A	II-a: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	II-b: Conflict with existing zoning for agricultural use, or a Williamson Act contract	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code, section 12220[g]), timberland (as defined by Public Resources Code, section 4526), or timberland zoned Timberland Production (as defined by Government Code, section 51104[g])	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.1-2: Result in the loss of forest land or conversion of forest land to non-forest use	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A and 3.3	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use; 3.3-6: Cause temporary loss or degradation of riparian habitat/forest or other sensitive natural communities; and 3.3-7: Cause long-term effects on riparian habitats/forests	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Air Quality		
3.2	3.2-2: Generate operations-related criteria pollutants and precursor emissions that could exceed local thresholds of significance	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as "Less Than Significant"		
SERP PEIR Section or Appendix	Impact	Would the proposed project cause any less-than- significant impact disclosed in the SERP PEIR to be potentially significant or significant?
Air Quality (cont'd)		
3.2	3.2-3: Generate operations-related carbon monoxide (CO) emissions that could exceed local thresholds of significance	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.2	3.2-4: Expose sensitive receptors to TAC emissions	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.2	3.2-5: Expose sensitive receptors to odors	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Biological Resources		
3.3	3.3-1: Cause temporary construction-related effects to fish and aquatic habitat	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.3-2: Cause temporary construction-related disturbance or loss of special-status fish or wildlife species and habitats	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.3-4: Cause loss or disturbance of special-status plant species and habitats	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.3-5: Cause discharge of dredged or fill material into jurisdictional waters of the United States	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.3-6: Cause temporary loss or degradation of riparian habitat/forest or other sensitive natural communities	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.3-7: Cause long-term effects on riparian habitats/forests	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.3	3.3-8: Conflict with tree preservation ordinances	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Cultural Resources		
3.4	3.4-2: Cause potential impacts on assumed historically significant levees.	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Geology and Soils		
3.5	3.5-1: Expose people or structures to significant risk of loss, injury, or death involving surface fault rupture	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.5	3.5-2: Expose people and structures to significant risk of loss, injury, or death involving strong seismic ground-shaking	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.5	3.5-3: Create geologic hazards from liquefaction, unstable soils, and shrink-swell potential	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.5	3.5-5: Cause damage to unknown, unique paleontological resources during earthmoving activities	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as “Less Than Significant”		
SERP PEIR Section or Appendix	Impact	Would the proposed project cause any less-than- significant impact disclosed in the SERP PEIR to be potentially significant or significant?
Greenhouse Gas Emissions		
5	Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Hazards and Hazardous Materials		
Appendix A	VII-a: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	VII-b: Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	VII-c: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	VII-g: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	VII-h: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildland are adjacent to urbanized areas or where residences are intermixed with wildland	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Hydrology and Water Quality		
3.7	3.7-1: Cause temporary, construction-related water quality effects from stormwater runoff, erosion, and spills	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.7	3.7-2: Cause long-term water quality effects	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.7	3.7-3: Create a potential increased risk of flooding from increased stormwater runoff	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.7	3.7-4: Cause hydraulic effects that increase water surface elevations	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Noise		
3.8	3.8-2: Cause an increase in temporary noise levels related to construction traffic	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as “Less Than Significant”		
SERP PEIR Section or Appendix	Impact	Would the proposed project cause any less-than-significant impact disclosed in the SERP PEIR to be potentially significant or significant?
Recreation		
Appendix A	XIV-a: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Utilities and Service Systems		
Appendix A	XVI-d: Have sufficient water supplies available to serve the project from existing entitlements and resources, or will require new or expanded entitlements	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	XVI-f: Be served by a landfill with sufficient permitted capacity to accommodate solid waste disposal needs	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	XVI-g: Comply with federal, state, and local statutes and regulations related to solid waste	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as “Less Than Significant” after Mitigation			
SERP PEIR Section or Appendix	Impact	Mitigation Measure	Would the proposed project cause any less-than-significant impact (with mitigation) disclosed in the SERP PEIR to be potentially significant or significant?
Air Quality			
3.2	3.2-1: Generate construction-related emissions that could exceed local thresholds of significance	3.2-1: Implement applicable air district-recommended mitigation measures for particulate matter and exhaust emissions	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as “Less Than Significant” after Mitigation			
SERP PEIR Section or Appendix	Impact	Mitigation Measure	Would the proposed project cause any less-than-significant impact (with mitigation) disclosed in the SERP PEIR to be potentially significant or significant?
Cultural Resources			
3.4	3.4-1: Cause potential impacts on identified cultural resources	3.4-1: Comply with the programmatic agreement (PA) prepared by USACE SHPO, and DWR; consult with stakeholders as required under section 106 and the PA; perform site-specific technical studies to identify and evaluate cultural resources; and implement avoidance or treatment protocols as necessary to the extent feasible	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.4	3.4-3: Cause potential impacts on previously unidentified cultural resources	3.4-3: Train construction workers before construction begins, monitor construction activities, stop potentially damaging activities, evaluate discovery(ies), and resolve adverse effects on significant resources	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
3.4	3.4-4: Cause potential impacts on previously unidentified human remains	3.4-4: Stop work in the event of a discovery of human remains, notify the applicable county coroner and Most Likely Descendant, and treat remains in accordance with state law and measures stipulated in the PA prepared by USACE and the SHPO	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Greenhouse Gas Emissions			
5.1.5	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	5-1: Implement pre-construction, final design, and construction BMPs	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as “Less Than Significant” after Mitigation			
SERP PEIR Section or Appendix	Impact	Mitigation Measure	Would the proposed project cause any less-than-significant impact (with mitigation) disclosed in the SERP PEIR to be potentially significant or significant?
Hazards and Hazardous Materials			
Appendix A	VII-d: Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code, Section 65962.5 and, as a result, create a significant hazard to the public or the environment	HAZ-1: Coordinate with regulatory agencies to preserve, modify, close, or avoid existing groundwater monitoring wells during SERP repairs	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	VII-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area	HAZ-2: Coordinate with airports to avoid potential hazards associated with height requirements in navigable airspace	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	VII-f: For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area	HAZ-2: Coordinate with airports to avoid potential hazards associated with height requirements in navigable airspace	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Noise			
3.8	3.8-1: Cause an increase in temporary noise levels from construction activities	3.8-1: Implement measures to reduce temporary noise levels from SERP construction	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

PEIR Impacts Identified as “Less Than Significant” after Mitigation			
SERP PEIR Section or Appendix	Impact	Mitigation Measure	Would the proposed project cause any less-than-significant impact (with mitigation) disclosed in the SERP PEIR to be potentially significant or significant?
Transportation/Traffic			
Appendix A	XV-a: Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ration on roads, or congestion at intersections)	T-1: Prepare and implement a traffic management plan for construction-related truck trips	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	XV-b: Exceed, individually or cumulatively, a level of service standards established by the county congestion management agency for designated roads or highways	T-1: Prepare and implement a traffic management plan for construction-related trips	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
Appendix A	XV-d: Substantially increase hazards resulting from a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	T-2: Restore damaged haul routes to their preconstruction conditions	Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>

Step 3. Complete Final CEQA Compliance Checklist

1. Is the proposed project outside the scope of the SERP covered by the PEIR? Yes ☐ No ☐
If yes, describe using an attachment to this checklist.

2. Does the proposed project have effects that were not examined in the SERP PEIR? Yes ☐ No ☐
If yes, describe using an attachment to this checklist.

3. Would the proposed project result in any new significant effects not disclosed in the SERP PEIR, including cumulative impacts? Yes ☐ No ☐
If yes, describe using an attachment to this checklist.

4. Would the proposed project result in an increase in the severity of any significant effects disclosed in the SERP PEIR, including cumulative impacts? Yes ☐ No ☐
If yes, describe using an attachment to this checklist.

5. Do any mitigation measures or alternatives exist that are considerably different from those analyzed in the SERP PEIR and would substantially reduce one or more significant effects on the environment, but for which DWR declines to adopt the mitigation measure or alternative? Yes ☐ No ☐
If yes, describe using an attachment to this checklist.

6. Based on the results above, is additional environmental documentation required?
If yes, specify the type of environmental compliance document required:

- Project-level Initial Study/Mitigated Negative Declaration or Negative Declaration Yes ☐ No ☐
- Project-level Environmental Impact Report Yes ☐ No ☐

If the answer to any of the Final CEQA Compliance Checklist questions is “yes,” the SERP PEIR likely does not provide full CEQA compliance, and the project being evaluated will likely not be repaired under the SERP unless the repair project can be modified to the extent that all answers to the Final CEQA Compliance Checklist questions are “no.”

